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THE ANALYST.

SEBASTIAN BACH AND HIS WORKS.

To make the English public better acquainted than it at present is with the name of a great composer—to promote investigation, serious study, and frequent performance of his works, and thus to improve the taste of both the connoisseur and amateur—are the objects of the present article. That the name of Sebastian Bach is scarcely, or at least by far too little, known in England—that his works are never heard at the great festivals, and very seldom, if ever, at the public concerts—are lamentable facts, we confess, and facts which speak but ill for the state of musical cultivation in our country. But the causes which have been, and still are, active in producing such culpable indifference, are, we think, by no means difficult of discovery. In the first place, Bach was never in England. This alone, in the hitherto existing and present state of musical knowledge in this country, is sufficient to account for his works not having received a much larger portion of that attention and admiration which, if the truth were known, they merit, to the exclusion of almost all others. The reverence in which we English hold the works of Handel is well known. And why this? Because they surpass all others in grandeur, beauty, and ideality of conception, in finish and elaborateness of execution? Oh, no! But simply because he had the good fortune to spend a great part of his life in our favoured isle, and there to produce his great works. This, without periphrasis, is one great constituent in the excessive and often ridiculous veneration in which the name of Handel is

held.* He is *our* Handel, belonging, we fondly imagine, to none but ourselves; *we* alone can understand him. Foreigners must be content with their Leos, their Pergolesis, their Bachs, their Grauns, and a host of other composers, respectable, no doubt, but not to be named in the same breath with our idol, our own peculiar treasure, the "giant Handel." And this because, instead of in Germany, he lived and wrote in England;† because he composed in a fog instead of under a blue sky; and because he gratified English self-love by setting his music to English words. All this, doubtless, is contemptible enough; but, contemptible as it is, such is the fact: we do but state it, in the hope that people, now knowing the seat of the disease, will set about removing it with all diligence.

Another cause of the neglect we are complaining of lies deeper, but will be equally apparent when we have explained, further on, what are the characteristics of Bach's music. At present we will only state, and that without fear of contradiction, that it is his surpassing excellence, his entire freedom from the pedantic and conventional observances of inferior minds, his independent boldness of imagination, which dared and performed every thing worthy of being performed, and, above all, the elevated ideal which was continually present to his mind, which has hitherto opposed effectual barriers to his just appreciation and extended fame. Let not these barriers any longer prevail; let us break through the trammels in which ignorance, self-esteem, and prejudice, have hitherto confined us, and resolve to seek out, and when found to appreciate, whatever is noblest and most elevated in the art; not to remain satisfied with any degree of excellence as long as there exists one yet more excellent, nor to pride ourselves on a one-sided admiration of any composer, resulting more from ignorance of his rival's than from due estimation of his own merits.

Another and the last cause which occurs to us is, the unreflecting readiness with which most men bow down before authority—in

* We yield to none in a rational admiration of Handel; but what we mean to assert is, that his almost exclusive celebrity in this country is owing rather to adventitious and extrinsic circumstances than to admiration arising from a knowledge of the merits of other composers, and his superiority over them. Besides this, Handel was essentially a popular composer—that is, he adapted his undoubtedly great powers to the capacities of uncultivated tastes; and inasmuch as he has done so has he lowered his claims to rank as a great artist, in the highest acceptation of the term.

† Handel composed the *Messiah* at Gopsall, the seat of Earl Howe, in Leicestershire. There is a good portrait of the "gigantic" melodist in the earl's collection at this family residence.—Eds.

other words, before the dictum of individuals. Now such a dictum, to be at all valuable, must proceed from one really competent to judge of the point on which he decides. We must, before we regard him as an authority, first ascertain that he has given the subject mature consideration, and then that, having done so, his mental faculties and their cultivation are such as will enable him to decide in a satisfactory manner. This mode of inquiry, however, even when properly conducted—which, unfortunately, it seldom or never is—furnishes us at best with a probability only, by no means with a certainty. Thus, the more attention any one has bestowed on a given subject the more *likely* he will be to give a correct opinion with regard to it; but that he *should* do so is altogether uncertain, for this simple reason, that the wisest and least prejudiced of mortals is liable to error, and if so, how are we to be satisfied that the very point to be determined is not that in which he will err? It is simply seeing with the eyes of others and neglecting the use of our own. No, no! see with your own eyes, hear with your own ears, and think with your own minds; use the faculties of others only to consult, not to follow their dictates. Let this be your rule in every matter, as well of opinion as of taste, and your safe-guard against the undue influence of authority. Almost all whom the English public has been accustomed to look up to on the subject of music, have either dismissed the name of Bach with a sneer, or else have awarded him so small a share of praise as almost to produce the same effect upon the reader. To adduce an example or two: Burney, in his *History of Music*, condescends to assign our author a niche in the temple of fame, with the limitation, however, that he would have merited one more honourable *if he had been more assiduous in courting popular applause!* This is the dictum of one of the wise ones by whom the public has been "tenderly led by the nose, as asses are." Dr. Crotch, of whom one should have expected something very different, owns that Bach's *Preludes and Fugues* are the finest ever produced, and that after hearing them almost all other music appears common and insipid; but, almost in the same breath, the Doctor dismisses his vocal works with the very negative praise that they are inferior to Handel's, and the equally positive accusation—which we shall, in the sequel, prove to be unfounded—that they are wanting in variety of excellence. Such a charge can only come from one who is either unable or unwilling to see things and judge of them as they exist, unless they contribute to the glory of a pre-established favourite. We have brought these two examples, in one of which the weak point of a really great man is con-

spicuously shewn, to confirm our position that the verdict of critics has hitherto been, if not always directly hostile, at least nugatory, to the reputation of Bach, and that this is one of the causes of the neglect by the public of the greatest composer who ever existed.

Far be from us the wish to set ourselves up as dictators in the place of any one. What we desire is, by inducing every one to reason, investigate, and admire with his own faculties, to undermine the power of all dictators whatsoever. If we shall have prevailed upon one only of our readers to work this hitherto neglected mine, and thereby be the mediate cause of his finding an inexhaustible store of intellectual wealth where he only expected labour and sorrow, we shall deem ourselves amply repaid for the time and space we have deveted to the subject; if upon more, so much the greater will be our reward. We now proceed to give a sketch of our author's life.

John Sebastian Bach* was born on the 21st of March, 1685, at Eisenach, where his father was musician to the court and town. He lost his mother before he was ten years of age, and his father shortly after. Thus early left an orphan, he was obliged to have recourse to John Christopher, his elder brother, organist at Ordruff, from whom he received his first instructions in playing the clavichord.† He soon became master of the pieces set before him by his brother, and, indeed, made such rapid progress as to excite his jealousy. The following anecdote is a striking instance of pitiful meanness on the one side, and dauntless perseverance on the other. Sebastian Bach had observed, in his brother's possession, a book containing the works of most of the celebrated clavichord composers of the day, and earnestly begged permission to profit by its contents. The refusal he received only increased his desire to possess the forbidden treasure. This he accomplished by passing his little hands through the interstices of a lattice door which barred his access to the object of his desire, rolling up the book, and thus bringing it forth to the light of day. He now set about copying its contents; but being obliged to use the greatest secrecy, and not being allowed the use of a candle, he was under the necessity of employing the light of the moon for this purpose. Thus was this child of genius

* These particulars are extracted from the life of our author by Dr. Forkel, a work which we cannot too often recommend to our readers. We must warn them, however, that they will find none of the gossiping details which occupy so much space in the popular biographies of Haydn, Mozart, and Rossini, and which to some, we fear, form their chief attraction.

† The forerunner of the harpsichord.

and industry engaged during six entire months, when at length he thought himself safely possessed of his treasure; and, while pleasing himself with the idea of making good use of it in secret, his brother discovered it, and without pity deprived him of what had cost so much labour. Yet, though his hopes were thus cruelly blighted, his toil was not without its reward. During his solitary moonlight vigils, with no other incentive than his enthusiasm, no other solace than the consciousness of his rising powers, he had been laying the foundation of that mighty edifice which was destined to astonish the world, and to endure, for countless ages, the admiration of all beholders, the envy and despair of all rivals.

Shortly after this, being again left destitute by the death of his brother, he went, in company with one of his schoolfellows, to Lünberg, where he engaged in the choir of St. Michael's School, as a soprano singer. His fine voice procured him here, for a short time, a good salary; but losing it soon, and not immediately acquiring one equally good in its stead, with it he lost his lucrative situation. His inclination to play on the clavichord and organ was at this time as ardent as in his earlier years, and impelled him to see and hear every thing which he thought could, in any way, contribute to his improvement. With this view, he not only went several times from Lünberg to Hamburgh, to hear the celebrated organist John Reinken, but also to Zell, in order to become acquainted with the prince's band—which consisted chiefly of Frenchmen—as well as with the French taste, which was then entirely new to him.

In 1703, when only eighteen years of age, he was made court musician at Weimar. This appointment, however, he exchanged in the following year for that of organist to the New Church at Arnstadt; probably to follow his inclination for playing on the organ with greater facility than he could at Weimar, where he was only engaged to play the violin. Here he began most zealously to make use of all the works for the organ at that time celebrated, for the purpose both of improving himself in the art of playing on that instrument, and in that of composition.* So ardent was his zeal, and so great his resolution to leave nothing undone which could be done towards the furtherance of this object, that he even made a

* If musical composition were considered an art instead of a science, we should have, instead of treatises without end and theories without number, a more useful, a more practical, musical education. It is through practice alone, not through theory, that art can be improved and elevated. How far the world in general is from this view of the subject it is needless for us to say.

journey on foot to Lubeck to hear the organist of St. Mary's Church in that city, with whose compositions he was already acquainted. For almost a quarter of a year he remained a secret hearer of this organist, and then returned to Arnstadt with an increased stock of knowledge.

The efforts of his zeal and unwearied diligence were followed by their appropriate reward. He received, in rapid succession, several offers of places as organist, and in 1707 he accepted that of St. Blasius, at Mühlhausen. A year, however, after he had done so, making a journey to Weimar to perform before the reigning duke, his execution on the organ was so highly approved of that he was offered, and accepted, the place of court organist. The extended sphere of action, with regard to his art, in which he here moved, impelled him to exert himself to the utmost; and it was probably during this period that he made himself the unrivalled performer he was universally allowed to be. He had still further occasion to improve himself when his prince, in 1717, appointed him director of the concerts, in which office he was expected to compose and perform pieces of sacred music.

Bach was now thirty-two years of age; he had made such good use of his time, had studied, composed, and played so much, and by unremitting diligence had acquired such a mastery over every principle of his art, that he stood, like a giant, able to trample all around him into dust. He had long been regarded, not by amateurs only, but by judges of the art, with wonder and admiration, when, in the year 1717, M. Marchand, who had attained considerable celebrity in France as a performer on the clavichord and organ, came to Dresden, where he played before the king with such success that a large salary was offered him if he would engage in his majesty's service. Volumier, at that time director of the concerts in Dresden, knowing Bach's superiority, in all respects, over the Frenchman, wished to procure a public contest between them, in order to give his prince and the inhabitants of Dresden an opportunity of judging of their respective merits. With the consent of the king, accordingly, a message was dispatched to Sebastian Bach, at Weimar, inviting him to this trial of skill: he accepted the invitation, and immediately set out on his journey. On his arrival in Dresden, Volumier procured him an opportunity of hearing Marchand play unobserved by the latter; and Bach, nowise discouraged by what he had heard, sent to the French artist a polite note, formally inviting him to the trial of their powers; offering to play without preparation whatever the other might please to set before

him, but requesting the same readiness on his part. Marchand having accepted the terms, and the time and place having been arranged, a large company, of both sexes and of the highest rank, assembled. Bach did not keep them long waiting, but Marchand failed to appear. On inquiry, it was ascertained that he had left Dresden that morning, without taking leave of any one. The whole of the performance, therefore, devolved on Bach, who excited the astonishment and admiration of all who heard him. Volumier's intention, however, to show in a striking manner the superiority of German art, was frustrated, though certainly the cause of that frustration was far from discreditable to Bach's powers and reputation.

In the year 1723 he was appointed music director to St. Thomas's School at Leipsig, where he remained till his death. Whilst in this situation he received the title of chapel master to the Duke of Weissenfels, and in the year 1736 that of court composer to the King of Poland.

The indefatigable diligence with which, particularly in his earlier years, he had frequently passed days and nights without intermission in the study of his art, had weakened his sight. This weakness continually increased towards the close of his life, till at length it terminated in a painful disorder of the eyes. Having been persuaded to apply to an oculist who had arrived in Leipsig from England, he submitted to an operation, which, twice proving unsuccessful, not only wholly deprived him of sight, but, conjoined with the probably noxious medicines which he took, completely undermined his hitherto vigorous constitution. For more than half a year after this he continued to decline, when, on the tenth morning before his death, he suddenly regained his sight. This, however, was only the last flicker of the dying flame: within a few hours he was seized with an apoplectic fit, followed by an inflammatory fever; and his enfeebled frame being unable to bear up under such a complication of disorders, he shortly after breathed his last, on the 30th of July, in the 66th year of his age.

Such was the life of this truly great man—a standing rebuke to many pseudo-musicians of the present, and it is to be feared of all times, who, by Nature endowed with a certain degree of talent, imagine that all the rest may be left to chance; who go through a certain—generally unprofitable—routine of study, and think they have done all that is necessary towards acquiring a mastery of the art; whose ideal, if they have any, consists in what they feel themselves competent to produce, not in what they feel they ought to produce; and who are not ashamed of sending forth to the world

works conceived without consideration and executed without study. Here we have the rare and noble example of a man naturally possessed of musical powers, greater, perhaps, than have ever been enjoyed by any single individual, engaged in diligent and unremitting study from early childhood to the close of his long career, never for one moment losing sight of the degree of excellence he wished to obtain, though he knew it unattainable, and consequently always making advances towards it. He who is satisfied with what he has already performed, and looks to no further improvement, does but shew how unworthy is his idea of what ought to be accomplished, and how contemptible his ambition. The essence of true genius is to keep in view a nobler, a more ethereal, sphere of action than is ever dreamt of by common minds—to regard what is already attained only as one step in advance towards the regions of perfect purity, of perfect beauty, in which alone it lives, and moves, and has its being. Can he who is endowed with such a genius ever rest in his glorious career?—ever console himself with the idea that he has done more or better than his rivals?—ever relax his efforts to fulfil the ideal on which his mind's eye continually rests? No! for rest implies satisfaction; and he is not, cannot be satisfied: no! for he disdains comparison with aught but his own elevated ideas of perfection: no! for he longs—he thirsts—for that perfection as the hart panteth for the water-brooks, and he knows that his utmost efforts can only *approach* him to the wished-for end, never enable him to attain it. Such is the essence of true genius—such its constitution; in this exists its difference from, its superiority over, that by no means uncommon talent (for it merits no higher designation) of retailing other men's ideas in a novel garb, accompanied by complete satisfaction at what it has produced, and by not the slightest desire for anything higher, anything nobler.

A correct edition of Bach's works, from the first effort of his infant muse to the last production of his genius, would, if arranged in chronological order, not only prove highly interesting to those who delight in watching the progress and internal development of the human mind, but would without doubt be in a great measure conducive to the revival of the art from that stagnation, that hopeless inanity, which, in this country at least, if not in others, is its unfortunate characteristic. Beautiful it is, in spring time of the year to see all Nature rising forth, as it were, from the bleak and dreary abyss of winter, unfolding herself before our eyes in all her loveliness and grandeur, and assuming various shapes, various dispositions, every one of them perfect, every one inimitable. More

beautiful still, to watch the development of the "human form divine" in its advance from helpless, shapeless infancy to the spring-tide of youth and beauty, a being but a little lower than the angels —the most perfect of his Creator's visible works. How far more beautiful, then, than either, to mark the progress of *mind*, the image and reflex of that Creator, from its first timid and unequal flight, to its subsequent sublime soarings in the ethereal regions of boundless space, of infinite perfection—the foretaste of what every one shall enjoy in an ever-happy, ever-during world! The work which assists us in researches of this nature, does more for human improvement, for human happiness, than thousands of the aimless, and therefore abortive, attempts of the present day, which men in their ignorance and their folly designate as art.

In the absence of a guide, such as we have referred to, we must rest satisfied with the sources of information and enlightenment which lie before us. Of all Sebastian Bach's voluminous works, we are as yet acquainted with eleven only, besides the preludes and fugues for the organ, now publishing in this country. Of these latter we shall merely say, that, exhibiting as they do a mastery over the art, unattained by any but our author, yet many of them bear faint traces only of the excellence at which he arrived during the last twenty years of his life: we therefore refer them to a time when his powers were already gigantic, but his judgment yet unmatured.*

* On this subject Forkel observes:—"Only uninterrupted practice can lead to true excellence. But if we were to pronounce all the works produced during this practice to be master-pieces, because master-pieces at length proceed from it, we should greatly err. This is the case with Bach's works. Though we find, in his earlier attempts undeniable evidences of a distinguished genius, yet they contain at the same time so much that is useless, poor, and extravagant, that they are not worth preserving—at least for the public in general; and, at most, may be interesting to the connoisseur who wishes to make himself acquainted with the course which such a genius has followed from the commencement of its career. For the separation of these attempts, or juvenile exercises, from the real master-pieces, Bach has himself given us two means, and we have a third in the art of critical comparison. At the appearance of his first work he was above forty years of age. What he himself, at so mature an age, judged worthy of publication, has certainly a presumption in its favour that it is good: we may therefore consider all the works which he himself had engraved to be extremely good. With respect to those among his compositions which circulate only in manuscript, and which are by far the greatest number, we must have recourse, in order to know what is worth preserving, partly to critical comparison, partly to the sound means which Bach has given us. Like all really great geniuses, he

The *Forty-eight Preludes and Fugues* form a master work unique of its kind. He who knows only the fugues of the greatest of other composers cannot possibly form any idea of the pitch to which this art may be brought, of the ends to which it may be adapted, or of the feelings which it may excite. Of the fugues of other composers, he who knows one knows all, and can play all; but each of Bach's fugues is a study of itself, and *requires* separate study properly to understand it. A characteristic and, at the same time, a beautiful subject, a delicious and equal flow of melody in all the parts, complete connection between the ideas, so that one seems necessarily to arise from the other, a bold and ever-varying modulation, perfect conformity of each part to the whole, and the result of all these, the highest degree of ease and freedom, of sublimity and beauty, of which the heart is capable—these are the distinguishing features of Bach's fugues. To say that they break through many of the (at that time) recognized rules of musical composition, is only saying that they opened new and hitherto untrodden paths of harmony and melody, which, once discovered, lead us through scenes of beauty and loveliness of which before we could form no idea. It is generally imagined that harmony and melody are totally independent branches of the art, and that the one may be perfected without the aid of the other. This is only partially correct, for while melody may acquire considerable excellence without the intervention of harmony, the latter improves only in proportion to the improvement of the former: in short, melody is nothing but a constituent part of harmony, which only arrives at its highest excellence by a judicious union of well-conceived and well-amalgamated harmonies. This union of melodies equally scientific and poetical is the essence of all Bach's harmonies; this it is which makes his works the admirable models they are. He is almost the only composer we are acquainted with who, taking this principle as his starting-post,* carries it out, fearless of the difficulties it in-

never laid aside the critical file in order to make his fine works still finer. Any of his early works that were at all susceptible of improvement he improved. The desire to improve was extended even to some of his engraved works. Under this head I reckon the most of what he composed before the year 1725. A great many later compositions, but which, for reasons easily understood, are likewise known only in manuscript, bear too evidently about them the stamp of perfection to allow us to doubt whether we shall number them among the essays or among the works of the accomplished artist."

* Weber, in his *Euryanthe*, has shewn what may be achieved in secular music by following this principle: but, in consequence, this master-piece of art

volves in its execution, and who shews in that execution that he is fully capable, not only of surmounting those difficulties, but of surmounting them with grace. The preludes, possessing as they do the same excellencies, the same beauties, and the same highly poetic feeling as the fugues, form, together with these, a treasure of art, a mine of wealth, which we can never study too deeply, never value too highly.

The world has never yet seen the instance of a great and original instrumental composer who has not also excelled in writing for voices. The means which are employed, the resources which are required for both, are essentially the same; they vary only in the mode of their adaptation to a proposed end. Can it be supposed, then, that he who excelled all rivals in the one, should not also be equally superior in the other? Such a supposition can only proceed from one possessed of partial and incorrect notions of the art. He who asserts that Bach's instrumental works exhibit variety, learning, and sublimity unsurpassed and unsurpassable, will be required to prove that the resources which, in instrumental music, have been employed to produce the highest excellence, become, when applied to vocal writing, in a measure unavailable to the same end. To do this is impossible; we are accordingly favored with the assertion only, not with the proof. As such, let us receive it, and proceed without delay to its refutation, as one detrimental, not only to the fame of him against whom it is directed, but also to the interests and advance of the art to which it relates.

Sebastian Bach's vocal works—all, so far as we are aware, devoted to sacred subjects—may be divided into those written for the Protestant, and those for the Roman Catholic, form of worship. This arrangement in the examination of his works is purely one of convenience, for the stamp of his exalted genius is to be found in all alike: of his compositions adapted to German words we are acquainted with seven only. We now proceed to their examination.

No. 1. *A Litany, after the Text of Martin Luther.*—This is a master-work, evincing, in its fullest extent, all the learning and sublimity of its author. It consists of one movement in D minor, with orchestral accompaniments. The alto, tenor, and bass voices, move easily and unconstrainedly in free canon, whilst the soprano makes the subjects that have been proposed by the other voices be

must wait for general appreciation till the time when music is cultivated as an art, and not as a mere idle amusement.

heard by augmentation. The accompaniment, which is such in the strictest sense of the term, and not a mere replicate of the voices, completes the harmony by traits of melody and imitation totally distinct from, yet perfectly in character with, the vocal parts. The boldest forms of progression—forms which our author alone ever attempted—are here employed with startling yet sublime effect. Nothing vulgar, nothing commonplace, nothing even beautiful, is admitted to profane this holy of holies; here all is grand, dignified, and majestic. Such was the idea entertained by this great man of the duties of the sacred composer—thus nobly has he fulfilled them.

2. *Herr deinen Augen sehen nach den Glauben.*—This piece consists of a chorus for four voices, with orchestral accompaniments distinct from the vocal parts; two airs, the one for a bass, the other for a tenor voice; an accompanied recitative, and two chorals.* The bass song is perfect of its kind; and being highly characteristic of Bach's manner of writing for single voices, we will now take the opportunity of explaining in what that manner consists, and in what it surpasses that of other composers. It is the common practice to make the voice the principal, nay, the sole interesting part, and to give the accompaniment only such secondary importance as may suffice to bring out the solo into the greatest possible relief. If nothing more than the good pleasure of the singer be desired, this is certainly the best way of obtaining it. If, again, the uninstructed in musical science are alone to be taken into account, the principle usually acted upon is still, undoubtedly, to be lauded. If, on the other hand, we regard music not merely as a means of gratifying individual vanity or uncultivated taste, but as an art capable of indefinite improvement, and in proportion to that improvement ministering to the development, and to the satisfaction when developed, of many of our highest faculties,† shall we not be compelled to

* Generally answering to our ideas of a psalm-tune, but sometimes (as in the choral *O Mensch bewein' dein' Sünde*, in the *Passionsmusik*) extended to whatever contains within itself a choral melody as a foundation on which to build a more varied superstructure. The piece we have instanced appears to us one of the finest specimens of this kind of composition with which we are acquainted.

† The new Science of Mind affords the most satisfactory explanation of the mental phenomena; and by no means the least useful part of this science is the degree of certainty with which we are enabled to discover the comparative utility of the various branches of study to which our attention may be directed. That science or that art (exclusively of material benefits to be derived from it) is more or less useful—that is, conducive to happiness—in proportion to the greater or less number or importance of the faculties it ad-

doubt, nay, utterly to deny, the propriety of giving the name of art to that which concerns itself only with a constituent and, in truth, insignificant portion, and leaves all the rest in comparative neglect? Such, however, *is* the principle laid down and acted upon, with more or less strictness, in the generality of solo songs. Their harmony is poor in exact proportion to the want of interest in the melodies which compose it, and in them melody is cultivated at the expense of harmony; thus gratifying almost exclusively one only of the faculties which the art has the power of bringing into exercise, namely, the mental faculty which discriminates, and finds pleasure in discriminating, difference of pitch—in other words, the perception of harmony. Now it will be admitted that the composition which affords delight to other powers of the mind, *in addition* to the one we have mentioned, is entitled to a higher rank than that which pleases this alone. The only question, then, is whether a more complicated style of composition, which should produce this effect, be appropriate to the species of writing whose objects we are now investigating. *A priori*, we should have answered, decidedly it is. Nay more, the only reasons why it so seldom is thus applied are the jealousy entertained by singers of any applause not bestowed on themselves, and the incompetence of the majority of the public to appreciate the higher excellencies of the art. *A posteriori*, we are fully and satisfactorily answered by a reference to Bach's achievements in this style. Bach's solos are, strictly speaking, rather concerted pieces, in which all the parts take an interesting share, not at all interfering with each other, but all contributing to make a complete and homogeneous whole. As in his fugues, so here, the interest continues increasing to the end, each idea flows naturally out of the preceding; the melody given to the voice is never doubled in the accompaniment, and those in the accompaniment cease when they have completed what they have to say, only resuming their functions when they can contribute to the common stock anything really valuable. Hence there are no arbitrary notes appearing on the paper, as if dropped from the clouds, *à propos de rien*, and producing a chasm in the succeeding phrase which the composer is at a loss how to fill up; no abrupt changes of key, re-

dresses. Viewed in this light, music has far higher claims upon our regard than is commonly imagined. It addresses itself directly to many of our highest faculties, and indirectly there are few to which it has not something to say. Had we space, we could go on to shew that the degree of praise to be awarded to particular styles of music may de determined in like manner.

sembling more the shifting scenes of a pantomime than anything for which we can reasonably account; no turns of melody in any single part which are not in strict accordance with the character of the rest; no repetition, caused rather by deficiency of ideas in the composer than by any consciousness that it will conduce to the effect of the composition. On the contrary, every note is so exactly in its place—the modulation is so even, so beautiful, like a fair stream gliding through peaceful and flower-besplanged meadows—each single melody sympathises so admirably with its companions, and with the disposition of the whole—the flow of the richest, the most poetical, ideas, is so boundless, so exhaustless—that we cannot but regard these productions as the most beautiful to be found in the entire range of the musical art.

3. *Ihr werdet Weinen und Heulen;*

4. *Du Hirte Israel! Höre;*

5. *Herr! gehe nicht in's Gericht;* are all three on the same plan as the foregoing. Nos. 3 and 5 contain each a chorus of unexampled learning and grandeur, and airs of the highest beauty and ideality. No. 4 might aptly be designated a sacred pastoral; and as an example of happy mixture of the two styles, as well as from its great beauties as a composition, it is worthy of all admiration.

6. *Gottes Zeit ist die allerbeste Zeit.*—This piece was certainly composed when our author's powers were yet immature. No one at all acquainted with his works can for a moment doubt as to this being one of them; but yet, amid a great deal of what is good and beautiful, we have here and there an infusion of what is weak, perhaps even commonplace. It is highly important that we thus distinguish between what is wholly worthy of admiration and study, and what is only partially so; otherwise we lower the standard of excellence, thus losing sight of the true aim of music, considered as a fine art. The piece of which we are speaking would perhaps be more pleasing than those we have just mentioned to uncultivated tastes; but the propriety of admitting such as judges in the fine arts we utterly deny, asserting, on the contrary, that it is only because the great majority of the public is uncultivated that this principle has ever been admitted and acted upon.

7. *Grosse Passionsmusik* (Messiah), according to the gospel of St. Matthew. This is an oratorio in the primitive sense of the term, being in its form essentially dramatic. It describes the last days of our Saviour on this earth; and is interspersed with chorals, performing the same office as the chorus in the Greek tragedy. One of these, *O Mensch bewein' dein' Sünde,* is of more worth than

the whole of such an effeminate and whining production as Spohr's *Crucifixion*, which has been so extravagantly bepraised by certain critics, and which has not the merit of novelty to recommend it. The double chorus in E minor, at the beginning of the *Passionsmusik*, is, both in design and execution, the grandest, the most productive of sublime and holy feeling of any we are acquainted with. The choruses throughout the work are all equally fine in their several styles: the *ad lib.* and accompanied recitatives are magnificent, both in expression and modulation; and the airs, possessing all the beauties which we have above attempted to describe, are worthy of equal praise. On the whole, admiring as we do Handel's great work on the same subject, yet regarding it as a work of art, and not as a mere candidate for the majority of suffrages, we should without hesitation assign it a lower rank than the Messiah of Bach. When musical education shall be conducted on the plan and to the extent which alone can make the individuals composing the public competent judges, we are confident that our verdict will be confirmed.

The works of this composer for the catholic church which we have seen, consist of three masses in G and A major and B minor, the two former for ordinary occasions, the latter for high mass. All three are very fine works, but the latter displays such consummate learning, such complete mastery of the art, and in the employment of these such inconceivable sublimity and such entire loveliness, that it seems rather the work of a disembodied and exalted spirit, than that of a mere mortal, occupied with the cares, the sorrows, the trials of this transitory state, and subject to the same failings as ourselves. As a work, as a masterpiece of art, it is worthy to stand beside the *Messiah* of the same composer; and any comparison which may be instituted between this and the greatest works of other composers, will only demonstrate the more clearly the immeasurable, the impassable gulph which lies outstretched between them.

We have now finished our too brief examination of these mighty achievements of human genius. It only remains for us to consider what will be their reception at the hands of the present and of succeeding generations. In the present state of general education, a knowledge of musical science is by no means accounted a universally indispensable element. The capability of performing on some instrument, with some power of interpreting the conventional symbols of musical combinations, is all that is required to complete the common idea of a musical education. Now, the one is a purely mechanical accomplishment, the other intellectual in a very slight degree;

both may be acquired without in the least cultivating the taste or imparting vigour to the higher powers of the mind. Further, in the present state of society, it is difficult for the *majority* of the public to obtain even *this* slight modicum of cultivation; and in the present state of society it is, perhaps, impossible for the majority to make that perfect use of their faculties which the Creator in bestowing them evidently willed. As long as things continue thus, man cannot enjoy that degree of happiness of which his mental constitution renders him capable, and to the attainment of which all his efforts are, or ought to be, directed. That things will *always* continue thus, we think too highly of the benevolence and wisdom of the Creator and of the just adaptation of all parts of his creation to each other to believe. We deem it every way possible, that each individual in a highly-civilized community may find not only leisure, but means also, for the due cultivation of the faculties granted to him for his happiness by the Creator: but until this *is* the case, how can we expect a due and universal appreciation of the wonders of Nature or of Art, designed, through the medium of those faculties, to be conducive to the well-being, to the felicity, of the human race? As it is, art is *not* art in its noblest acceptation—namely, when considered as the means of producing the highest gratification to faculties in the highest state of cultivation; but a mere farce, a juggler's trick, at best but the pander to individual vanity or ignorant presumption.

In conclusion, our thorough conviction is, that Sebastian Bach, having shewn in his works what art should be, not what it is, must still wait many a long year for general appreciation, general admiration; but that, when once appreciated, once admired, he will be looked upon as the great pioneer who, disregarding vulgar and temporary applause, singing only for "himself and the muses," cleared the way for the new and glorious career which art has yet to run, under auspices more bright—for aims more noble.

[Since the above was written, we understand that the directors of the Birmingham Festival intend (and before this meets the reader's eye the intention will probably have been fulfilled) to favour the public with one or two specimens of Bach's powers, selected from the *Passionsmusik*, noticed above. Better late than never, say we; but why these eternal selections, why this insane policy of giving one or two bricks as a specimen of the entire edifice? The directors intend to give Mendelsohn's *Paul* entire. Now, we ask, which has the greatest claims to be considered as the greater composer, Mendelsohn or Bach? The answer to this question should decide, in our opinion, the propriety of giving the work of the one in all its completeness, and of the other scattered fragments only.]

ESSAY ON THE RATIONALE OF CIRCUMSTANTIAL EVIDENCE.

No. II.

By William Wills, Esq.

In a former Essay on Circumstantial Evidence,* it was stated to be a cardinal rule of jurisprudence to require direct proof of the *corpus delicti*. In the present essay I purpose to investigate the reason and illustrate the propriety of this rule.

Every allegation of legal crime involves the establishment of two separate propositions; namely, that an act has been committed from which legal responsibility arises, and that such act has been committed by a particular individual. Such a complication of difficulties often attends the proof of crime, and so many cases have occurred of conviction of alleged offences which were never committed, that it is a sound rule of legal procedure, derived to us from the Romans, those great lights in all that relates to the principles of jurisprudence, to require express and unequivocal proof of the *corpus delicti* before it is permitted to adduce evidence tending to inculpate any particular person.

If it be objected that rigorous proof of the *corpus delicti* is sometimes unattainable, and that the effect of exacting it must be that crimes will occasionally pass unpunished, it must be admitted that such may possibly be the result. But it is answered that where there is no proof, or, which is the same thing, no sufficient proof, of crime, there can be no legal guilt. Considerations of expediency can never supersede the immutable obligations of justice, and occasional impunity of crime is an evil of far less magnitude than the punishment of the innocent. Such considerations of mistaken policy led the civilians to adopt that cruel and execrable maxim, "in atrocissimis leviores conjecturæ sufficiunt et licet judici jura transgredi;" and when the plea of expediency is once permitted to influence judicial integrity, such is the logical and inevitable consequence. The rule in question is so important in relation to cases of circumstantial evidence, that it will be expedient to illustrate its pertinency and propriety at some length, and, for the sake of simplicity and

* *Ante*, p. 177.

consistency, the exemplifications will be borrowed from cases of alleged murder.

In the application of this rule to cases of homicide, it is essential that there be distinct proof, 1st, of the fact of *death*, and 2nd, of the *specific cause* of death; nor without such proof can any individual be reasonably implicated, or required to explain or account for facts of supposed suspicion. The inspection of the body necessarily affords the best evidence as well of the identity of the deceased as of the fact of death; and a conviction of murder is never allowed to take place unless the body has been found, or there is equivalent proof of the fact of death; and many cases have shewn the peril of a contrary practice. Joan Perry and her two sons were executed, in the year 1660, for the murder of William Harrison, who had suddenly disappeared, but in about two years afterwards re-appeared. The deceased had been out to collect his lady's rents, and had been robbed by highwaymen, who put him on board a ship, which was captured by Turkish pirates, by whom he was sold to a physician near Smyrna.* Sir Matthew Hale mentions a case where A was long missing, and upon strong presumptions B was supposed to have murdered him, and to have consumed him to ashes in an oven, that he should not be found. Whereupon B was indicted of murder, convicted, and executed, and within one year after A returned, being, indeed, sent beyond sea by B, against his will; "and so," he adds, "though B justly deserved death, yet he was really not guilty of that offence for which he suffered."†. Sir Edward Coke also gives the case of a man who was executed for the murder of his niece, afterwards found to be living. [See also Green's case, *State Trials*, vol. xiv., p. 1311, and Arnott's *Collection of Criminal Trials*].

But to require the production of the body in all cases would be unreasonable, and lead to absurdity and injustice; since the murderer might secure impunity by effectually disposing of his victim's remains, which has often been attempted by burning, but generally without effect, owing to the slow and imperfect combustibility of animal matter. The fact of death may, therefore, be inferred from such strong and unequivocal circumstances of presumption as render it morally certain, and leave no ground for reasonable doubt. Thus, a mariner was indicted for the murder of his captain at sea, and a witness stated that the prisoner had proposed to kill the captain;

* *State Trials*, vol. xiv., p. 1312.

† *Pleas of the Crown*, vol. ii., c. 39.

that, being alarmed in the night by a violent noise, he went upon deck and saw the prisoner throw the captain overboard; that he was not seen or heard of afterwards, and near the place on the deck where the captain was a billet of wood was found, and the deck and part of the prisoner's dress were stained with blood. It was strenuously argued that, as there were many vessels near the place where the transaction was alleged to have taken place, the probability was that he had been taken up by some of them and was then alive; but the court, though they admitted the general rule of law, left it to the jury to say, upon the evidence, whether the deceased was not killed before the body was cast into the sea, and the jury being of that opinion, the prisoner was convicted and executed.*

The cases which present the greatest difficulty in establishing the *corpus delicti*, are those of infanticide, poisoning, and suicide. As a consequence of the rule which requires express proof of the *corpus delicti*, that, in cases of alleged infanticide, it must be proved that the child had acquired an independent circulation and existence; it is not enough that it had breathed in the course of its birth.† If a child has been wholly born and is alive, it is not essential that it should have breathed at the time it was killed; as many children are born alive and yet do not breathe for some time after birth.‡

Cases of this distressing class generally involve questions purely or principally of medical jurisprudence, and are, therefore, so far not within the province of this Essay.§ The moral circumstances generally adduced as indicative of this crime, may commonly be accounted for by the agency of less malignant motives, and can seldom be unequivocally pronounced to afford a safe presumption of murder. Hard must be the struggle between the opposing motives of shame and affection, before a mother can form the dreadful resolve of taking away the life of her own child. The unhappy subject of these conflicting emotions is commonly the victim of brutality and treachery. Deserted by a heartless seducer and scorned by a merciless world, scarcely any condition of human weakness can be imagined more calculated to excite the compassion of the considerate and the humane.‖ The wisdom and the humanity of the legislature, in

* Hindmarsh's case, Leach's *Cases in Crown Law*, vol. ii., p. 571.

† Rex *v.* Poulton; Carrington and Paine, vol. v., p. 399—and Rex *v.* Enoch, *ibid.*, 539.

‡ Rex *v.* Brain; Carrington and Paine, vol. vi., p. 350.

§ See *The Proofs of Infanticide Considered*, by Dr. Cummin, for a summary of the present state of medico-legal knowledge on that subject.

‖ See Dr. William Hunter's tract on *Child Murder*.

accordance with the spirit of the times, has repealed the cruel rule of presumption created in a barbarous age,* and made the endeavouring to conceal the birth of a child, by secret burying or otherwise disposing of the body, a substantive offence, instead of treating it as a conclusive presumption of murder.†

In charges of poisoning, the object is to determine whether poison has been administered, and whether it has been the cause of death; since it does not necessarily follow, even where poison has been administered, that death has not resulted from natural causes.‡

The principal grounds upon which the proof of poisoning generally rests, are 1. the symptoms during life; 2. the post mortem appearances; 3. chemical tests; 4. the results of experiments upon animals; and 5. moral circumstances.

The first and second of these heads of evidence involve questions of a medical nature merely: but the diversity of opinion which prevails amongst medical jurists respecting the sufficiency of such evidence alone, and the consideration that the facts must ultimately be submitted to a popular tribunal, acting upon the principles of common observation and experience, render it expedient to notice the general result of those opinions as applicable to this numerous class of cases of circumstantial evidence.

There appears to be no difference of opinion, that the symptoms and post mortem appearances which are usually relied upon as indications of poisoning are such as may in general be produced by other causes. Dr. Christison, while he admits, with every esteemed author on medical jurisprudence, that the symptoms, however exquisitely developed, can never justify an opinion in favour of more than high probability,§ maintains that the doctrine applies only to the *general* characteristics of the symptoms, and that in some cases of *particular* poisons, as, for instance, sulphuric, nitric, and oxalic acids, arsenic, the compounds of mercury,‖ and some others, the symptoms only may occasionally afford decisive evidence of poisoning.**

* Stat. 21, Jac. I., c. 27, *ante*, p. 32.

† Stat. 9, G. IV., c. 31., s. 14.

‡ Mary Ann Alcorn's case, Syme's *Justiciary Reports*, vol. i., p. 221; and Charles Munn's case, Inverness Spring Circuit, 1824. Christison, *On Poisons*, pp. 50, 82.

§ Christison, *On Poisons*, p. 39, citing Orfila, Hencke, and Beck; and see, to the same effect, *Outlines of a Course of Lectures on Medical Jurisprudence*, by Dr. Traill, p. 42.

‖ Christison, *On Poisons*, pp. 165, 207, 308, 402.

** See the case of Richard Overfield, Shrewsbury Assizes, March 19, 1824,

Dr. Christison conceives that, in many instances, both of acute and chronic poisoning with the strong acids, contrary to the general statements of most systematic writers on medical jurisprudence, distinct evidence may be presented from the morbid appearances only.*

The effect of these several heads of evidence was much discussed in the memorable case of Captain Donellan, who was convicted at the Warwick Spring Assizes, 1781, of the murder of his brother-in-law, Sir Theodosius Boughton. The material facts of this case were as follow:—Sir Theodosius Boughton was a young man of fortune, twenty years of age, and in good health and spirits, with the exception of a trifling ailment, for which he occasionally took a laxative draught. His mother and his brother-in-law, Captain Donellan, and his sister, Mrs. Donellan, lived with him. At the age of twenty-one years Sir Theodosius would have been entitled to a fortune of above £2,000. a year, which, in the event of his dying under that age, would have descended to his sister, Mrs. Donellan. Lady Boughton went into her son's room for the purpose of giving him his draught, and remarked that it smelt like bitter almonds. In about two minutes Sir Theodosius struggled very much, as if to keep the medicine down, and Lady Boughton observed a gurgling in his stomach; in ten minutes he seemed inclined to doze, but in five minutes afterwards she found him with his eyes fixed upwards, his teeth clenched, and froth running out of his mouth; and within half an hour after taking the draught he died. Lady Boughton ran down stairs to give orders to a servant to go for the apothecary, who lived at Rugby, a distance of three miles, and in less than five minutes the prisoner came into the bed-room; and after she had given him an account of the manner in which Sir Theodosius had been taken, he asked where the physic bottle was, and she shewed him the two draughts. Donellan then took up one of the bottles and said "Is this it?" and being answered "Yes" he poured some water out of the water-bottle, which was just by, into the phial, shook it, and then emptied it out into some dirty water which was in a wash-hand basin. Lady Boughton said, "You should not meddle with the bottle;" upon which the prisoner snatched up the other bottle, and poured water into it, and shook it, then put his finger to it, and tasted it. Lady Boughton again asked him what he was about, and said he ought not to meddle

for poisoning his own child with sulphuric acid, *Edinburgh Medical and Surgical Journal*, vol. xxii., p. 222.

* Christison, *On Poisons*, 52, 169.

with the bottles; on which he said he did it to taste it, though he had not tasted the first bottle. The prisoner ordered a servant to take away the basin, the dirty things, and the bottles, and put the bottles into her hands for that purpose, who put them down again on being directed by Lady Boughton to do so. The body was examined ten days after death, but putrefaction was far advanced, and the head was not opened, nor were the bowels examined, and in other respects the examination was incomplete and unskilfully performed; "so that very little reliance," says Dr. Christison, "can be placed on the evidence from the inspection of the body."* Captain Donellan had a still in his own room, and had used it for distilling roses; and a few days after Sir Theodosius's death he brought it, full of wet lime, to one of the servants, to be cleaned. It also appeared that Sir Theodosius, shortly before his death, had bought arsenic to poison fish, and some of it was afterwards found locked up in his closet. Captain Donellan appears to have resorted to several disingenuous devices to prevent the post-mortem examination of the body, and to induce Sir William Wheeler, the young man's guardian, to believe that an examination had taken place, when the professional men, having been led by the prisoner to suppose it a case of ordinary sudden death, had declined the examination, on account of the advanced state of putrefaction in which they found it; there were several other circumstances of suspicion in the prisoner's conduct. Four medical men, three of whom were physicians, were examined on the part of the prosecution, and expressed a very decided opinion—mainly grounded upon the symptoms, the smell of the draught, as observed by Lady Boughton, and the similar effects produced by experiments on animals with laurel-water to the symptoms in the case of Sir Theodosius—that the deceased died of poison, and that the particular poison was laurel-water. The weight of Dr. Rattray's opinion was greatly diminished by the fact that, after he had known all the symptoms, and seen the body opened, he had been as positive that Sir Theodosius died from arsenic as he was at the time of the trial that he had died from laurel-water. When asked "Why may you not be mistaken now?" he answered, "I cannot conceive that, in these circumstances, any one can be mistaken as to the medicine; from the sensible qualities described by Lady Boughton I believe it to be of that nature"—the sensible qualities referred to being the resemblance of the smell to that of bitter almonds. Mr. John Hunter was examined on the part of the

* Christison, *On Poisons*, p. 725.

prisoner, and stated a positive opinion that the symptoms did not necessarily lead to the conclusion that the deceased had taken poison, and that the appearances upon dissection explained nothing but putrefaction. This trial has given rise to great diversity of opinion amongst legal and medical men, and the evidence of Mr. Hunter has subjected him to severe animadversion by many of his professional brethren.*

Dr. Christison thus expresses his opinion upon this memorable case :—"The conclusion at which, in my opinion, every sound medical jurist must arrive is, that poisoning in the way supposed was very probable. But I cannot go along with those who think that it was certain; nor is it possible to see on what grounds such an opinion can be founded, when the general or moral circumstances are excluded."†

This opinion seems to be sound and discriminating. It is clear, from an attentive perusal of the testimony of the professional witnesses, that their opinions were not formed upon symptoms and appearances only, but upon those symptoms and appearances joined with other facts and circumstances. Mr. Hunter was much pressed by the counsel for the prosecution, and by the learned judge, to give an opinion grounded upon those mixed elements; about which, he justly observed, in one of his answers, every man was as good a judge as he was.

The most decisive and satisfactory evidence of poisoning, is the discovery, by chemical means, of the existence of poison in the body, in the matter ejected from the stomach, or in the food or drink of which the sufferer has partaken. Dr. Christison dissents from the opinion expressed by all German and most French authors in medical jurisprudence, that "poisoning can never be completely substantiated unless the particular poison be found out."‡ That broad doctrine has certainly never been adopted in English jurisprudence;§ and its adoption would be fraught with danger. Some of the vegetable poisons, at least in the present state of chemical science, scarcely admit of that kind of proof;‖ and to require it would be to proclaim impunity to offenders skilled in medical chemistry. A case of conviction occurred in Scotland, where a servant girl had put some

* Beck's *Elements of Medical Jurisprudence*, 901; Christison, *On Poisons*, p. 725; *The Theory of Presumptive Proof.*

† Christison, *On Poisons*, p. 724.

‡ Christison, *On Poisons*, Preface, p. 14.

§ Rex *v.* Donellan, *ut supra*; and Rex *v.* Angus, *infra.*

‖ Christison, *On Poisons.*

poisonous matter into gravy. Dr. Christison was of opinion that all the symptoms might have been produced by natural means; and was led to suppose that poison had been swallowed merely from the circumstance of two persons being taken ill nearly at the same time, after partaking of the same food, and with symptoms which various kinds of poisons would produce. In answer to questions by the court, he said the probability was greatly strengthened by the fact that the violence of the symptoms was in proportion to the quantities of the suspected food taken.* The prisoner admitted that she had introduced a little powder, but declared that it was only for a bit of fun, and not to do harm, but merely to sicken the parties. This question was the subject of much discussion in the celebrated case of Castaing. But, upon general principles, it cannot be doubted that courts of law would require chemical evidence of the poisoning to be adduced wherever it were attainable; and it is believed that *no* modern case of satisfactory conviction can be adduced where there has not been such evidence or, in its absence, the equivalent evidence of confession. The following remarkable case is highly instructive in relation to this important question.

Robert Sawle Donnall, a surgeon and apothecary, of Falmouth, was tried at the spring assizes, 1817, at Launceston, before Mr. Justice Abbott, for the murder of Mrs. Elizabeth Downing, his mother-in-law. The prisoner and the deceased were next-door neighbours, and lived upon friendly terms; and there was no suggestion of malice, nor could any motive be assigned which could have induced the prisoner to commit such an act, except that he was in somewhat straightened circumstances, and in the event of his mother-in-law's death would have become entitled to a share of her property. On the 19th of October the deceased drank tea at the prisoner's house, and returned home much indisposed, retching and vomiting, with a violent cramp in her legs, from which she did not recover for several days. On Sunday, the 3rd of November, after returning from church, she dined at home on boiled rabbits smothered with onions, and, upon the invitation of her daughter, drank tea in the evening at the prisoner's house, with a family party. The prisoner handed to the deceased cocoa and bread and butter; and while she was drinking the second cup she complained of sickness and went home, where she was seized with retching and vomiting, attended with frequent cramps, and then a violent purging took place, and at eight o'clock the next morning she died. The nervous

* Rex *v.* Mary Ann Alcorn, Syme's *Justiciary Reports*, vol. i., p. 221.

coat of the stomach was found to be partially inflamed or stellated in several places, and the villous coat was softened by the action of some corrosive substance; the blood-vessels of the stomach were turgid, and the intestines, particularly near the stomach, inflamed. The contents of the stomach were placed in a jug in a room to which the prisoner—to whom, at that time, no suspicion attached—had access, and it appeared that he had clandestinely tampered with those contents by throwing them into another vessel containing a quantity of water; and there were other suspicious moral circumstances in his conduct which are purposely omitted in this analysis, as the case turned entirely upon the question of the sufficiency of the proof of the *corpus delicti*. Dr. Edwards concluded from the symptoms—the shortness of the illness and the morbid appearances—that the deceased had died from some active poison; and, in order to discover the particular poison supposed to have been used, he applied to the contents of the stomach the chemical tests of the sulphate of copper in solution, and the ammoniaco-nitrate of silver, which severally yielded the characteristic appearances of arsenic: the sulphate of copper producing a green precipitate, whereas a blue precipitate is formed if no arsenic be present; and the nitrate of silver producing a yellow precipitate, instead of a white precipitate, if arsenic be not present. Dr. Edwards considered these tests infallible, and used them, as he stated, because they would detect a more minute portion of arsenic; on which account he considered it to be more proper for the occasion, as, from the appearance of the tests, he found there could not be much. Dr. Edwards also tried experiments upon the bile mixed with water and with a decoction of onions, to ascertain whether any substances taken into the stomach would alter the appearances produced by those tests, but they produced no appearance of arsenic. The great object of the prisoner's counsel was to extract from Dr. Edwards, upon his cross examination, admissions, 1st. That the symptoms and appearances were such as might have been occasioned by some other cause than poisoning; 2nd. That the reduction test would have been infallible; and 3rd. That it might have been adopted in the first instance, and might also have been tried upon the matter which had been used for the other experiments. Upon his re-examination, Dr. Edwards accounted for his omission of the reduction test by stating that the quantity of matter left after the other experiments would have been too small, and that it would not have been so correct to use the matter which had been subjected to the experiments.—The prisoner's counsel, having obtained this admission, proceeded

to neutralize and explain away the circumstances of presumption against the prisoner, by shewing, first, that the symptoms and morbid appearances, though they were such as might and did commonly denote poisoning, did not exclude the supposition that they might also have been occasioned by cholera morbus, or some other cause; secondly, that no valid reason existed why, if arsenic had been contained in the contents of the stomach, it had not been reproduced in the metallic state, either by an original experiment, or by experiments on the matter to which the other tests had been applied; thirdly, that the dilution of the contents of the stomach had not rendered the experiment of reduction impracticable, but only more dilatory and troublesome; and, fourthly, that the tests actually resorted to were fallacious, and produced the same appearances upon application to innocent matter, namely, the sulphate of copper producing the green, and the nitrate of silver producing the yellow precipitate, on being applied to an infusion of onions. It was in vain to urge that a decoction of onions was not the same thing as that particular preparation of onions of which the deceased had partaken, and that, in the hands of the witness for the prosecution, this experiment had been attended with a different result; the facts adduced by the prisoner's witnesses conclusively proved that the appearances produced by the tests employed might be produced by some other cause than the presence of arsenic, and therefore that the tests were fallacious, and that an infallible test might have been resorted to. Thus every one of the grounds of presumption against the prisoner were successively destroyed, so that the case was left without any substantial foundation; though the conduct of the prisoner had naturally created, and must necessarily leave, strong and well-founded impressions unfavourable to the belief of his innocence.

The chemical evidence brought forward in the case of Mary Ann Burdock, who was convicted at the Bristol Spring Assizes, 1835, of the murder of Mrs. Clara Ann Smith by poison, presents an instructive contrast with that adduced in the last-mentioned case: the moral evidence was also strong. The deceased, a widow, about sixty years of age, was possessed of considerable property in money, and had for several years lived in lodgings at various places, and ultimately went to lodge with the prisoner, who kept a lodging-house in Bristol. In October, 1833, the deceased became indisposed from a cold; and in the evening of the 26th of that month the prisoner gave her some gruel, into which she had been observed, by a young woman hired to wait on the deceased, to put some pinches of yellow powder,

which she stated to be to relieve her from pain, after which she twice washed her hands. The servant remarked to the prisoner upon this, as an unusual mode of administering a powder. The prisoner cautioned the servant not to take of any thing out of vessels used by the deceased, falsely representing her to be dirty in her habits; and cautioned her not to tell the deceased that she had put anything into the gruel, representing that if she knew there was anything in it she would not take it. The prisoner carried away what was left of the gruel; and in a few minutes after the deceased had partaken of it she complained of being poorly, and in half an hour became ill; vomiting, purging, and violent pain ensued, and in about two hours she expired. The prisoner had employed a man, about six days before this event, to purchase arsenic in order to poison rats, a pretext which was proved to be groundless. The deceased was buried on the 28th of October, but her friends did not hear of her death until many months afterwards. From the change which took place in the prisoner's habits and mode of living after Mrs. Smith's disease, from her denial that the deceased had left any property, and from some other circumstances, suspicion was excited, and the corpse was disinterred and examined on the 24th of December, 1834, and found to be in a remarkable state of preservation. Without detailing all the appearances, it is sufficient to observe that the mucous membrane of the stomach and duodenum was smeared very thickly with a large quantity of a yellow substance, which penetrated in patches the coats of the stomach and intestines; and where the spots had so penetrated, the inside of the intestinal canal was stained to a much greater extent than the outside; so that it must have penetrated from the interior to the exterior, as would be the effect of the matter having been taken into the stomach. Mr. Herapath, the lecturer on chemistry and chemical toxicology at the Bristol Medical School, submitted the yellow powder found in the stomach to various experiments. Having dried it, he ground some of it up with carbonate of soda and charcoal, and introduced it into a reducing tube, and immediately formed a volatile metallic body, which was metallic arsenic; he then oxidized the metallic arsenic, and it sublimed into a white volatile oxide, which was characteristic of arsenious acid; he then made a solution of the oxide by infusing two drops of water, and added a small portion of ammoniacal nitrate of silver, when there was formed the characteristic yellow precipitate. He put into another portion a minute quantity of ammoniacal sulphate of copper, which immediately produced the green precipitate of Scheele; and, finally, he reduced a larger quanti-

ty, and passed through it a stream of sulphuretted hydrogen gas, and reproduced the original orpiment, or sulphuret of arsenic: these various experiments were repeated five or six times, and uniformly with the same results. Mr. Herapath then washed the stomach in water, allowed the substance to precipitate, dried and weighed it, and found it to contain seventeen grains; he then destroyed the animal matter, dissolved the arsenic, turned the sulphur into sulphuric acid, and precipitated the whole by sulphuretted hydrogen gas, and that reproduced sulphuret of arsenic. From thirteen grains of the mixed matter he obtained four grains of sulphuret of arsenic: there were still some portions adherent to the stomach, which he could not wash off, and it must be remembered that some had been evacuated by vomiting. This case is one of the most satisfactory on record.

Sometimes, even with all the aids of science, it is impossible to arrive at a safe and unquestionable conclusion in cases of this kind. A young man, named Freeman, a druggist's apprentice, was tried at the Leicester spring assizes, 1829, before Lord Chief Justice Best, for the murder of Judith Buswell, his master's female servant, by Prussic acid. The deceased was pregnant by the prisoner, and was found one morning dead in bed. Several circumstances led to the suspicion that the apprentice had been instrumental in the administration of the poison; but it was proved that the deceased had made arrangements for a miscarriage by artificial means on the very night in question; and it was therefore represented, on the part of the prisoner, that she had taken the poison of her own accord. It appeared that she had taken Prussic acid from a partially emptied phial, which lay corked and wrapped in paper beside her bed, where she was found lying with the bed-clothes drawn up to her chin and her arms folded across the trunk; a piece of leather and string, which appeared to have been taken from a bottle, were found in the room. It was considered in the highest degree improbable, but was generally admitted by the medical witnesses to have been *possible*, that the deceased might have corked the bottle after taking the dose from which she died, and the prisoner, though his conduct had very deservedly drawn suspicion upon him, was therefore acquitted. The fact is instructive and admonitory, that Professor Christison, in the subsequent edition of his book, *On Poisons*, with the candour which ever marks the scientific mind, acknowledges that the concurrence which he had previously expressed in the opinion of the majority of the witnesses, that there could not be time, after swallowing the

poison, for the performance of the acts of volition implied in the supposition of suicide, was given rather too unreservedly; and he mentions a lately published case of suicide, in which an apothecary's assistant was found dead in bed, with an empty two-ounce phial on each side of the bed, the mattress, which is used in Germany instead of blankets, pulled up as high as the breast, the right arm extended straight down beneath the mattress, and the left arm bent at the elbow.*

On the trial of Charles Angus, at Lancaster, in 1808, for the murder of Miss Burns, there was abundant evidence of suspicious conduct to fix the prisoner as the criminal, had there been clear proof of the *corpus delicti*. The cause of death was an aperture in the stomach, alleged to have been caused by the action of poison; but it was considered possible that it might have been a case of spontaneous perforation after death, from natural causes, and there was no evidence that poison had been administered. One of the medical witnesses caused great offence by his testimony in favour of the accused, which gave rise to much angry controversy; but the appearances have since been declared, by the high authority of Professor Christison, to be incompatible with the effects of a strong corrosive poison, unless death had occurred very soon after it was swallowed, which was out of the question.†

It of necessity happens that circumstances of suspicion in the conduct of the accused are frequently blended with the scientific testimony; but it is apprehended that conviction cannot be considered satisfactory, unless the crime be established by adequate evidence, independently of the moral circumstances. The peculiar office of evidence of moral circumstances appears to be, the discrimination of the guilty individual, rather than to supply deficiency of substantive and independent evidence as to the existence of the *corpus delicti*. Dr. Christison urges that "there may be sufficient evidence in the symptoms and morbid appearances without any chemical facts to render poisoning so highly probable, that, in conjunction with strong moral circumstances, no sensible man can entertain any doubt on the subject." Mr. Justice Abbot, in his charge to the jury upon Donnall's case, in reference to this question, said, "if the evidence as to the opinions of these learned persons who have been examined on both

* Rex *v.* Freeman—Christison, *On Poisons*, p. 705; *London Medical and Surgical Journal*, vol. viii., pp. 527, 750; and Beck's *Medical Jurisprudence*, p. 888.

† Christison, *On Poisons*, p. 133; and the printed report of the trial.

sides, should lead you *to doubt* whether you should attribute the death of the deceased to arsenic having been administered to her, or to the disease called cholera morbus, then, as to this question, as well as to the other question, the conduct of the prisoner is most material to be taken into consideration; for he, being a medical man, could not be ignorant of many things as to which ignorance might be shewn in other persons: he could hardly be ignorant of the proper mode of treating cholera morbus, he could not be ignorant that an early burial was not necessary; and when an operation was to be performed in order to discover the cause of death, he should not have shewn a backwardness to acquiesce in it; and when it was performing, and he attending, he could not surely be ignorant that it was most material for the purposes of that investigation that the contents of the stomach should be preserved for minute examination."* It is manifest that the learned judge intended these remarks to apply only to cases circumstanced as the case before him was; for thus to conjoin the moral circumstances with the medical facts, as an element of proof of the poisoning in cases not so circumstanced, appears to be open to objection, since the hypothesis of poisoning is resorted to in order to account for the moral circumstances as well as for the morbid appearances, while the moral circumstances are appealed to as corroborative of the evidence of poisoning.

Suicide and accident are sometimes artfully suggested and plausibly urged as the causes of death, where the allegation cannot receive direct contradiction; and in such cases the truth can be ascertained only by comparison of all the attendant circumstances, some of which, if the defence be false, are commonly found to be irreconcileable with the cause assigned. Although these cases are generally connected with questions of medical jurisprudence, the scientific facts must nevertheless be submitted to the test of experience and common observation, as applied by the mass of mankind in many other cases not less difficult of determination. Such cases, therefore, in their more general aspects and bearings, belong to general jurisprudence, and supply important illustrations of general legal doctrines; and they, moreover, shew the manner in which such defences are frequently repelled by their manifest incompatibility with the general circumstances.

William Corder was tried at the Bury St. Edmunds Summer Assizes, 1828, for the murder of Maria Marten. The deceased had

* Report of the trial, *ut supra*.

borne a child to the prisoner, and was taken by him from her father's house, under the pretence of taking her to Ipswich to be married. The prisoner having represented that the parish officers meant to apprehend the deceased, she left the house, on the 18th of May, in disguise, a bag containing her own clothes having been taken by the prisoner to a barn belonging to his mother, where it was agreed that she should change her dress. The deceased was never heard of afterwards; and the various and contradictory accounts given of her by the prisoner having excited suspicions, which were confirmed by other circumstances, it was ultimately determined to search the barn, where, on the 19th of April, a distance of nearly twelve months, the body of a female was found, which was clearly identified as that of the deceased. A handkerchief was drawn tight round the neck; a wound from a pistol ball was traced through the left cheek, passing out at the right orbit; and three other wounds were found (one of which had entered the heart) made by a sharp instrument. The prisoner, who, in the interval, had removed from the neighbourhood, upon his apprehension denied all knowledge of the deceased; but in his defence he admitted the identity of the remains, and alleged that an altercation had taken place between them at the barn, in consequence of which, and of the violence of temper exhibited by the deceased, he expressed to her his determination not to marry her, and left the barn; but that immediately afterwards he heard the report of a pistol, and, going back, found the deceased on the ground, apparently dead; and that, alarmed by the situation in which he found himself, he formed the determination of burying the corpse and accounting for her absence as well as he could. But the variety of the means and instruments employed to produce death, some of them unusual with females, were considered important in connection with the contradictory statements made by the prisoner to account for the absence of the deceased and the general moral circumstances, to discredit the account ultimately set up by him. He afterwards made a full confession, and was executed pursuant to his sentence.*

At the Durham autumn assizes for 1824, Mr. Hodgson, a surgeon, was tried for attempting to poison his wife. It was proved that pills containing corrosive sublimate, and compounded by the prisoner, were given by him to her in place of pills of calomel and opium, which had been ordered by her physicians. But it was alleged by him that, being at the time intoxicated, he had mistaken for the shop bottle

* Printed report of the trial.

containing opium the corrosive sublimate bottle, which stood next it. This was certainly an improbable error, considering that opium was in powder, and the sublimate in chrystals. But it was not the only one which he alleged that he had committed. Not long after his wife took ill, the physician sent the prisoner to the shop to prepare for her a laudanum draught, with water for the menstruum. When the prisoner returned with it, the physician, in consequence of observing it to be muddy, was led to taste it, before he gave it to the sick lady, and, finding it had the taste of corrosive sublimate, he preserved and analyzed it, and discovered that it did contain that poison. The prisoner stated in defence, that he had a second time committed a mistake, and, instead of water, had accidentally used for the menstruum a corrosive sublimate injection, which he had previously prepared for another patient: but this was proved to have been impossible, since the injection contained only five grains to the ounce, while the draught, which did not exceed one ounce, contained fourteen grains.*

James Greenacre was tried before the Central Criminal Court, at the Old Bailey, on the 10th of April, 1837, for the murder of Hannah Brown. The prisoner and the deceased were to have been married; in the prospect of which event the deceased had converted nearly all her goods into money. On the morning of the 24th of December the deceased left her home, stating to a neighbour that she was going to the house of her intended husband at Camberwell, but should return in the evening. On the 28th of December the trunk of a female was found in the Edgeware Road, without its head or legs; on the 6th of January a female head was found in the Regent's Canal; and on the 2nd of February the legs of a female were found in an ozier-bed, at Camberwell: these several parts were clearly ascertained to belong to the same body, and were identified as the remains of the deceased. Upon his apprehension the prisoner at first denied all knowledge of the deceased; but he subsequently admitted that, on the evening of the day on which the deceased left her home, she came to his house, and he stated that they had had an altercation, in consequence of her duplicity in the statement of her property; and that, during this conversation, the deceased was moving backwards and forwards in her chair, which was on the balance; that he put his foot to the chair, and she fell back, with great violence, against a block of wood; and that, finding life extinct, he made up his mind,

* *Edinburgh Medical and Surgical Journal*, xxii., p. 438; and Christison, *On Poisons*, p. 81.

in the alarm of the moment, to conceal her death and get rid of her remains, in order to which he had divided them in the manner stated. This ingenious fabrication was clearly refuted by the professional witnesses, who proved that a wound in the eye, which had occasioned the escape of the humours, and around which there was an ecchymosis, must have been inflicted during life, and deprived the deceased of sense for a time, and that it could not have been occasioned by a blow at the back of the head; also that, from the retracted state of the muscles of the neck, and the emptied condition of the blood-vessels, the throat must have been cut either before or immediately after death.

The length to which this paper has extended renders it necessary to postpone the expression of some interesting reflections which spring from the subject; but we may remark in general, that the rule which has been dilated upon is one of evident wisdom and utility, and that the rigorous application of it is essential to well-founded confidence in the truth and correctness of judicial determinations grounded upon circumstantial evidence.

SKETCHES OF EUROPEAN ORNITHOLOGY.

Gould's "Birds of Europe."

Parts IX. and X.

Part IX.—The first plate contains a very pretty and spirited representation of the Common Scops, *Scops Aldrovandi*,—Scops petit-duc, *Fr.*,—Kleine Ohreule, *G.** This species has a very wide geographic range, being found in Europe, Asia, and Africa. Mr. Gould has received specimens from China. It is common in the south of Europe, but very rare in the north and in England. "In

* As regards the French, German, and Italian names, we prefer taking them from other authors, as we find them, to altering them according to our own views. They require, however, much revision: we believe such a reform has been effected in Mr. C. T. Wood's *Ornithological Guide*; but we have not at present a copy of that work at hand.—Eds.

Europe it appears to be strictly migratory, arriving late in spring, when moths and the larger Coleopterous insects, upon which it principally subsists, abound; but in the hotter portions of the Old World, where such insects are always abundant, numbers of these birds are stationary throughout the year: to these, its most common food, are added birds, mice, and other small animals. In its manners it is principally nocturnal, issuing forth from its hiding place on the approach of twilight, in chase of those insects which are also roused from their state of repose at the same time.—It breeds in holes of decayed trees, clefts of rocks, and old buildings, the eggs being four or five in number, of a pure white."—The sexes resemble each other. Our author has, of course, represented this bird of the natural size.

A male and female, rather less than the natural size, and beautifully executed, of the Common Teal, *Querquedula crecca*,—Petite Sarcelle, *Fr.*,—Anatra querquedula, *It.*,—Kriek Ente, *G.* Widely distributed over the Old World, but not found in America, the bird which occurs in that country, and which has been mistaken for the present species, being distinct. Breeds in the north of Britain, but great flocks visit us every winter.—Selby asserts that the broods hatched in Britain never leave us, and we have no doubt whatever of the accuracy of the statement. "The Teal breeds," according to that author, "in the long rushy herbage about the edges of lakes, or in the boggy parts of the upland moors. Its nest is formed of a large mass of decayed vegetable matter, with a lining of down and feathers, upon which the eggs rest;" these "are eight or ten in number, and of a yellowish white."

The Middle Woodpecker, *Picus medius*,—Pic mar, *Fr.*,—Picchio sarto, *It.*,—Weisbunt Specht, *G.* The plate represents a male and female of the natural size; they would have been better had the attitudes been less constrained—a very common fault with ornithological painters, but one from which Mr. Gould generally steers clear. Common in Europe, especially the southern districts. It feeds, like its congeners, on insects procured in the usual manner of the Woodpeckers, but also, according to the author of the work before us, on "various fruits and berries." The eggs are of a glossy white, and laid in the holes of trees. This species is remarkable for the similarity of the sexes, which can only be determined with certainty by dissection.

The Common Jay, *Garrulus glandarius*,—Geai, *Fr.*,—Chiandaia, *It.*,—Eichel Krahe, *G.* The figure, natural size, is in many respects very good; but it wants that indescribable pertness of expres-

sion so remarkable in the Jay in its natural haunts. This beautiful and well-known bird is common in the temperate portions of Europe.

Common Ossifrage, *Ossifraga albicilla*,—Aigle pygargue, *Fr.*,—Fisch Adler, *G.* Excellent figures of an adult and a young bird of the first year, one third of the natural size. "It is the most common of the European Eagles, and perhaps the most widely dispersed. In the British Islands it frequently occurs along the rocky shores of England, Wales, Ireland, Scotland, and the adjacent islands, and many pairs are known annually to breed in different parts of the three last-named countries." Its range over Europe is extensive, but it is most abundant in the northern districts, chiefly resorting to the sea-shore and to the margins of rivers and lakes, in pursuit of fish. It also feeds on hares, lambs, fawns, &c., and even carrion. Builds mostly on rocks, but sometimes on the tops of lofty trees. It lays two white eggs. The sexes are similar, but the young do not attain the mature plumage—characterized by the white on the tail, and the yellow colour of the bill—till three or four years old.

A male, natural size, of that pretty little bird the Crested Tit, *Parus cristatus*,—Mésange huppée, *Fr.*,—Hauben Meise, *G.* Sir W. Jardine assures us that this bird regularly breeds near Glasgow; and although it is unquestionably a very rare bird in Britain, yet nothing is commoner than to meet with specimens said to be British, but which are for the most part imported from the continent, in many parts of which it abounds. "In habits it resembles the rest of the smaller Tits, feeding on insects, berries, and the seeds of evergreens."—M. Temminck says it builds in the holes of walls or trees, or in the abandoned dreys of Squirrels and Pies. The eggs are as many as ten in number, of a white colour, marked on the larger end with spots of blood red. The sexes offer no difference in plumage.

Dusky Sandpiper, *Totanus fuscus*,—Chevalier arlequin, *Fr.* The plate represents two individuals, one in summer plumage, the other assuming its winter dress. The figures are good, but we do not find in them quite so much of the graceful form Mr. Gould speaks of in his description. Abounds in many parts of Europe and Asia, breeding in the northern portions of the former. Resorts to the borders of lakes and morasses, and feeds on fresh-water mollusca, insects, and worms. Nidification unascertained. The sexes are similar in plumage, but the female is somewhat superior in size, and the young birds are distinguished by the numerous white spots on the back.

Wood Shrike, *Lanius rufus*—Piegrièche rousse, *Fr.*—Velia col-

capo-rosso, *It.*—Rothköpfiger Vurger, *G.* Very accurate figures of the male and female, natural size, but they might have been more spirited. Abundant on the continent, especially the warmer portions, but only a straggler in Britain. In habits, observes Mr. Gould, it resembles the Redbacked Shrike, but it differs from its congeners in the close resemblance of the sexes, which are only distinguishable by the brighter hues of the male. Feeds on coleopterous and other large insects, and also on young and weak birds. Builds in the forked branch of a bush, and lays five or six whitish-green eggs, irregularly blotched with grey.

Spotted Nutcracker, *Nucifraga caryocatactes*—Cassenoix, *Fr.*—Ghiandaia nucifraga, *It.*—Nussrabe (Nut Raven!), *G.* Found almost throughout Europe, being migratory in the northern districts; a rare straggler with us. Its habits and food bear a strong resemblance to those of the Woodpeckers, and, like them, it ascends the trunks of trees in search of insects. It also subsists on nuts and berries. Builds in the holes of trees, enlarging the cavity if necessary, and lays five or six yellowish-white eggs. The male is somewhat larger than the female, and, Mr. Gould thinks, of a slightly brighter hue. The figure, natural size, is as good as we can desire.

Crested Grebe, *Podiceps cristatus*—Grêbe huppé, *Fr.*—Colimbo cristato, *It.*—Gehaubter Steissfuss, *G.* We have no hesitation in pronouncing this decidedly the best of Mr. Gould's plates we have hitherto criticized. The adult especially is perfect in every respect, and is truly a model of ornithological painting. Inhabits Britain and the temperate regions of Europe generally, and also parts of Asia and Africa, frequenting lakes and rivers, and occasionally resorting to the sea-coast. The nest is formed of a mass of aquatic herbage, on the margin of the water, with the variations of which it rises or falls. Lays three or four greenish-white eggs, stained with brown. The young birds and the adults in winter plumage have been described as the Tippet Grebe. Mr. Gould alludes to the circumstance of feathers being frequently found in the gizzard of this bird. Audubon speaks of a feathery substance occurring in the gizzard of an American species, and states that it consists of vegetable matter eaten by the bird. Some time since we expressed an opinion that the matter found in the Crested Grebe might be accounted for in a similar manner: but the examination of a quantity taken from the stomach of that species, and sent to us by an Irish gentleman, convinced us that they are really feathers from the breast of the bird. This being the case, the circumstance is not easily accounted for. True, a few

might be swallowed during the process of preening the feathers, but not to the amount in which they appear to be commonly met with. Besides, why should that be the case with the Grebes alone, and especially in the Crested species? But we must pass on.

On the next plate are figured a male and female, size of life, of that beautiful little bird the Dartford Whinling, *Melizophilus provincialis*—Becfin pittechou, *Fr.* This species is very local in its distribution, being only found in the warmer parts of Britain and Europe. In this country it is chiefly met with near London, frequenting furze commons, where it breeds. The nest consists of dry grass and vegetable fibres, intermingled with wool. The eggs resemble those of the Whitethroated Fauvet. The plumage of the female is more dusky than that of the male. Our author's representations are very faithful. Montagu's description of this species is remarkably interesting, and is, we doubt not, familiar to our readers.

Baillon's Crake, *Crex Baillonii*—Poule-d'eau Baillon, *Fr.* An adult and a young bird are figured; the attitudes are not unexceptionable, but the representations are otherwise excellent. Inhabits the southern and south-eastern districts of Europe, and has occasionally been taken in England, though its occurrence in this country was unknown before the time of Montagu, the indefatigable author of the *Ornithological Dictionary*, a work which will always be valuable in the eyes of the ornithologist. This pretty little bird frequents the margins of lakes, rivers, and marshes, especially where vegetation is luxuriant. Here it sedulously hides itself from observation, and can rarely be induced to take wing. "It is said to be able to swim and dive very readily, and makes its nest near the water's edge, in which it deposits seven or eight eggs, not unlike a large olive in form, size, and ground-colour, but spotted with darker greenish-brown." Feeds on worms, slugs, insects, seeds of plants, &c. "A specimen in the collection of the Rev. Dr. Thackeray, Provost of King's College, Cambridge, was taken, during a cold and frosty January, on some ice near Melbourn, about nine miles south of Cambridge. To this spot, originally fen land, the poor bird had resorted, in an inclement season, to obtain a meal, but, having wandered far from its native and more congenial latitude, was so exhausted by want of food or the low temperature of the season, or the combined effects of both, as to allow itself to be taken alive by the hand." The sexes scarcely differ at all, but the young birds want the blue-gray colour on the under parts characteristic of maturity.

Scarlet Trascel, *Erythrospiza erythrina*—Bouvreuil Pallas, *Fr.*

Lovely figures of the male and female, the latter being distinguished by the entire absence of the bright scarlet tints of the male. The Scarlet Trascel has been confounded occasionally with Wilson's *Fringilla purpurea*, an entirely distinct species. It appears to be very rare in many parts of Europe, and our author is in possession of some of the few specimens existing in British collections. It is, however, common in Russia. It frequents gardens, and its habits are supposed to resemble those of our Hedge Coalhood, *Pyrrhula vulgaris*. The young birds, as well as the female, have no scarlet on the head and rump; and we think, with Mr. Gould, that the male casts off its brilliant attire in winter.

Common Buzzard, *Buteo vulgaris*—Buse, *Fr.*—Mause Falk, *G.* We are very well pleased with the plate, representing an adult, two-thirds of the size of life. The sluggish and timid nature of this species is pretty generally known. Feeds on small mammalia and reptiles, and even, when pressed by hunger, on dead or putrid animal matter. Inhabits Britain and the temperate parts of Europe, especially the well-wooded districts. "The nest is constructed of sticks in the densest part of the wood, and it sometimes takes up with the deserted nests of Crows, Pies, &c. The eggs are two or three in number, of a dirty white colour, slightly spotted with reddish-brown." Mr. Gould informs us, from his own experience, that "the birds of one year old are much lighter in their plumage than those of the succeeding year," and that they become darker each year until maturity, when the colouring is considerably more uniform.

Subalpine Fauvet, *Ficedula leucopogon*—Becfin subalpin, *Fr.*—We believe it will be found necessary to remove this species from the genus *Ficedula*; probably it will stand intermediate between that group and *Melizophilus*. The figures on the plate, of both sexes, summer plumage, are very fair. The male is distinguished by the reddish-chesnut colour on the throat and breast: the young differ but little from the female. The Subalpine Fauvet never occurs in England: "the natural habitat is limited to the south of Europe, especially Italy and Sardinia; it is also known to exist in considerable abundance on the banks of the Nile, as far as Abyssinia. It frequents bushes and underwood, living upon insects, small caterpillars, &c. Of its eggs and nidification nothing is known.

An adult male in the spring plumage, and a young bird of the year, three-fourths of the natural size, of the Common Cormorant, *Cormoranus carbo*—Grand Cormorant, *Fr.*—Marangone aquatico, *It.*—Schwarze Kormoran, *G.* The plate is "not bad," but scarcely

so excellent as many of the preceding. Common on the rocky and reedy shores of Britain and the rest of Europe. "They occasionally perch and roost on trees, towers, and rocky projections; and although the summits and ledges of rocks overhanging the sea are the principal and favourite breeding stations, still it is known to incubate occasionally in trees, and even upon the ground, as is the case in the Farn Islands, and the extensive reed beds in Holland. The nest is composed of dried sea-weed rudely put together, and often of a considerable thickness; the eggs, generally three in number, are greenish-white, covered with a chalky coating, and extremely small compared with the size of the bird. In swimming, the body of the Cormorant is nearly all immersed below the surface of the water, the tail serving as a very effectual rudder, by means of which it is able either to dive or turn in the most rapid and dexterous manner." Its food consists of fish, of which it destroys immense numbers, chasing them under the water; the dilatability of the throat enables it to swallow with safety fishes of comparatively large bulk. The young have the whole of the under parts dusky white, and want the plumes on the head of the adults.

The Orpheus Fauvet, *Ficedula orphea*—Becfin orphée, *Fr.*—The bill, and, indeed, the whole body of this bird are of a stouter make than those of the more typical members of the genus; and, with due deference to the opinion of Mr. Gould, we should be inclined to remove the species from *Ficedula*. Common in the south of Europe, and sometimes found in Switzerland, but never further north. Specimens have been received from India. According to Professor Savi, its habits resemble those of the common White-throated Fauvet of Britain. Feeds on insects and berries, and builds in bushes, often in company with others of the same species; also, according to Temminck, in the holes of old walls, or under the eaves of deserted and isolated buildings. Lays four or five eggs, nearly white, irregularly marked with yellowish blotches and small brown spots. The female is distinguished by the head being of the same colour as the rest of the plumage. These birds are not remarkable for beauty, either as regards shape or plumage, but they are well figured in the plate.

Ring Ouzel, *Merula torquata*,—Merle à-plastron, *Fr.*,—Merla torquata, *It.*,—Ring Drossel, *G.* Our author's figures, of a male and female, size of life, are beautiful, and so is his description, which we shall present entire:—"'The periodical visits of this bird to our coast,' says Mr. Selby, 'are contrary to the others of the genus that

migrate, viz., the Fieldfare, Redwing, and Common Thrushes, as it arrives in spring, and immediately resorts to the mountainous districts of England and Scotland, preferring those that are the most stony and barren.' Although it doubtless always breeds in the situations above described, it may not unfrequently be seen traversing the hedgerows of uncultivated lands during its passage to and from distant climates.—In general form and appearance it strictly resembles the Blackbird (Garden Ouzel), but in its manners it is much more shy and distrustful, rarely permitting itself to be approached. Unlike that bird, it is not observed skulking among the bushes, &c., but affects more open situations, which doubtless renders it habitually cautious, as being more necessary to its safety. Its voice is somewhat harsh and powerful, consisting of a few notes, which, according to Mr. Selby, are not unlike those of the Missel Thrush. On the continent it is distributed through most of the northern countries, and is very common in Sweden, France, and Germany; indeed, with the exception of Holland, it is universally distributed throughout Europe, as well as the adjacent parts of Asia and Africa. In all these countries it is said to be migratory; and we may easily conceive the cause of this to be a failure of a supply of food in the peculiar situations it frequents, and the consequent necessity of retiring to a more genial climate, where berries, fruits, and insects may be easily obtained.—The male differs from the female in the greater purity and contrast of his colours. The general plumage is black, each feather having a margin of grey; a broad gorget of pure white extends across the chest; the bill is blackish brown at the tip and yellow at the base; legs blackish. The plumage of the female is more clouded with brownish-grey, the pectoral gorget being less extensive, and tinged with dusky brown. The young males closely resemble the adult female, but in young females the gorget is scarcely perceptible."

Marbled Pochard, *Fuligula marmorata*,—Canard marbré, *Fr.* An adult, rather less than the size of life, is beautifully figured. Inhabits the south of Europe, especially Sardinia and the Asiatic borders.—Habits unknown; but Temminck informs us that the sexes are similar. The peculiar marbling of the plumage at once distinguishes this bird. We question the propriety of classing the Marbled Pochard in *Fuligula*, and our author appears to be of the same opinion, at least judging from what he says of *F. rufina*, a closely-allied species.

Foolish Guillemot, *Uria troile*—Grand Guillemot, *Fr.*—Troil Lumme, *G.* The plate represents, in a very creditable manner, an

adult and a young bird of the year, of the natural size. The native habitat of this common and well-known bird "extends throughout the northern regions of both hemispheres." It is a truly oceanic species, only frequenting rocky shores during the breeding season. It abounds on the rocky coasts of the whole of northern Europe, "whence it migrates southwards on the approach of winter, returning again with the vast shoals of fishes which pass northward in spring." "After breeding they undergo a partial moult," and "lose their primaries so simultaneously as to be incapable of flight for a considerable period; a circumstance of little moment, as they easily elude pursuit by diving, in which they excel surprisingly."

PART X.—Rock Pigeon, *Columba livia*—Colombe biset, *Fr.*—Haus Taube, *G.* Mr. Gould's figure is, in many respects, excellent, especially as regards the feathering; the shape is not so perfect as it might be. The representation is of the size of life. It is tolerably certain that this bird is the origin of the dove-cot Pigeon. Inhabits Europe and Africa, particularly the north of the latter country, frequenting rocks and deserted buildings on the sea-coast. Very common along the shores of the Mediterranean, and with us in the Orkneys; according to the author of the work before us, it is "also to be met with wherever abrupt rocks near the sea afford it a congenial asylum." Lays its two white eggs on the shelves of the rocks, and "is said to breed twice or thrice in the season." Judging by the fecundity of the domesticated race, this seems by no means improbable. Feeds on grain and seeds, also slugs, &c. The sexes closely resemble each other, but we believe a slight variation in the brightness of the rich metallic hues on the neck might serve to distinguish them.

Redbacked Shrike, *Lanius collurio*—Pie-grièche écorcheur, *Fr.*—Velia minor, *It.*—Rothrückiger Vurger, *G.* This bird is not known in Scotland, but is the commonest of the genus in England, especially in the midland and southern counties, arriving at the close of April or the beginning of May, according to the forwardness or otherwise of the spring. Also inhabits the whole of Europe and North Africa. It frequents downs and open pastures, singly or in pairs, and is partial to hedge-rows. Feeds on grasshoppers, beetles, and "the larger kinds of flies, which it often takes on the wing," in a similar manner to the Flycatcher. It is also "known to attack young and feeble birds, mice, lizards, slugs, &c., which," like most of its congeners, "it impales on a sharp thorn or spike previously to tearing them to pieces." "Builds its nest in sharp thorny bushes, often at a considerable distance from the ground, construct-

ing it of dried grasses and wool, with a lining of hair." The eggs are five or six, pinkish-white, "with spots of wood-brown disposed in zones, chiefly at the large end." The female is at once distinguished by the absence of the grey hood and the black streak on the face. The plate represents an adult male and a young male. Both are good, the latter unexceptionable.

Common Ruff, *Machetes pugnax*—Bécasseau combattant, *Fr.*—Gambetta scherzosa, *It.*—Streits Strandlaufer, *G.* We are presented with figures of the male in summer and winter attire, and an adult female, all of the natural size and very good. It is much less abundant in England than formerly, but is still common in the marshy districts of France, Germany, and Holland. In summer it extends northward as far as Lapland, Sweden, and Russia, where it is ascertained to breed. It is a strictly migratory bird. The Ruff is polygamous, and its pugnacity is well known. The flesh of the Ruff is considered a great delicacy, and considerable numbers are annually fattened for the table. The adult male in summer plumage is at once distinguished by its superior size, by the beautiful feathers on the neck, and by the general brightness of its tints. The male in winter attire resembles the other sex, except that the colour of the throat and breast is very much lighter in the former.

Penduline Lannet, *Ægitalus pendulinus*—Mésange rémiz, *Fr.*—Beutel Meise, *G.* A pair of these pretty little birds, with their nest, are figured; we do not particularly admire the plate. Inhabits the south of Europe, frequenting the margins of rivers and inland lakes, especially where reeds, willows, &c., are plentiful. Its habits much resemble those of our Bearded Pinnock, *Calamophilus biarmicus*. Feeds on seeds, aquatic insects, and small mollusca. We believe the Pinnock likewise subsists on all the above kinds of food, though Mr. Gould appears to think otherwise. The nest is "constructed of the soft down of the willow or poplar, and this substance, which closely resembles cotton wool, is interwoven together with admirable ingenuity, so as to form a flask-shaped nest, with a lateral opening into the internal chamber. It is suspended at the extremity of a drooping branch of a willow, or any similar tree, overhanging the water." The eggs, five or six, are pure white, marked with a few red blotches. The colours of the female are more dingy than those of the male; young birds want the black mark on the face.

An adult male, in the breeding plumage and natural size, of the Roseate Tern, *Sterna Dougalli*—Terne Dougall, *Fr.* A very pretty and well-executed figure in many respects. The delicate rose colour

on the breast, and the slender black bill, distinguish this species from the rest of the genus. Its flight is peculiarly buoyant. Abounds particularly in the southern regions of the Old World. Its cry is said to be somewhat like the word *crake*. "Its eggs much resemble those of the Arctic Tern, but are a little larger, more pointed at the small end, with the ground-colour inclining to cream white or pale wood brown." Food and habits similar to those of the other Terns. Time of arrival "the same as that of the Sandwich and Arctic Terns, and by the end of September nearly the whole of them have departed for warmer latitudes." The sexes do not differ.

Pied Woodpecker, *Picus major*—Pic épeiche, *Fr.*—Picchio vario, *It.*—Bunt Specht, *G.* This is an exquisite plate, representing, of the natural size, a male and female, and the young stretching their heads out of the hole of a tree to receive the food their mother is conveying in her bill. The female especially is admirably executed. Common in all the wooded portions of Europe, including Britain. Feeds on insects and their larvæ, which it seeks on the trunks of trees or on moss-grown rails; likewise "commits great havoc among cherries, plums, and wall-fruits in general." Flight short and rapid, and manners brisk and lively. Lays in holes of trees, sometimes excavating these to a considerable depth. Colour of the eggs, like those of other Woodpeckers, glossy white. The male is only distinguished by the occipital band of scarlet. It is, however, a singular and apparently unaccountable fact, that "the young of both sexes, for the first three or four months of their existence, have the whole of the brow scarlet," whereas the adult female has no scarlet at all on the head, and the male has only the narrow occipital band above alluded to.

Marsh Sandpiper, *Tringa stagnatilis*—Chevalier stagnatile, *Fr.*—Teich Wasserläufer, *G.* An elegant figure of the adult male, winter plumage and size of life. In form it resembles *Totanus fuscus*, but it is little more than half the size of that bird. Does not occur with us, and is very rare on the continent, though it extends "from the north of Europe, its summer habitat, throughout the eastern provinces, as far as the Mediterranean, frequenting the borders of large rivers, but never taking up its residence on the seashore." Obtains its food in marshes and similar places. The summer plumage of the male is lighter on the upper parts; the young have those parts brownish-black, each feather being bordered with yellow. Total length of the adult male about nine inches.

Little Bittern, *Botaurus minutus*—Héron blongios, *Fr.*—Sgarza

guacco, *It.*—Kleiner Reiher, *G.* Figures, natural size, of the adult and of a young bird in intermediate plumage, are given. The same fault is observable in this plate as in the majority of Audubon's drawings, namely, too great a straining after pictorial effect. Mr. Gould considers that the Little Bittern ought to form a genus fully as distinct from *Botaurus* as this latter is from *Ardea*. In England it is a rare bird, but it abounds in many parts of the continent, especially the southern provinces. "From the seclusion of its haunts and the difficulty of its access, its nest is seldom seen; it is said to be placed in low bushes and tufts of herbage, amongst the thickest rushes." The eggs, five or six, are pale greenish-white. The body of this bird being remarkably compressed, it is enabled to elude pursuit with ease, by threading the interstices of the rushes, &c., which it frequents. Like the other Herons, it frequently perches; its flight is short, slow, and heavy. Feeds on small fishes, frogs, snails, insects, and the like. The sexes are similar, and the young are distinguished by the absence of the green on the head and back; they pass through several stages before arriving at maturity.

Maguari Stork, *Ciconia Maguari*,—Cicogne Maguari, *Fr.* This large and handsome bird is well figured, less than half the natural size. It cannot be termed a typical species, being, in fact, an approximation to the form of the genus *Mycteria*; but its habits much resemble those of the White Stork. Its true habitat is America, and the bird is only an accidental visitor to Europe; it has never occurred in Britain. Nidification and eggs unknown. The whole of the body is white, except the quills, secondaries, and upper tail-coverts, which are glossy greenish-black; bill greenish-yellow, passing into dull blue at the tip; tarsi and toes red. The Maguari Stork is "considerably larger than the White Stork."

Little Zapern, *Zapornia pusilla*, Steph.,—Poule d'eau poussin, *Fr.*,—Galinella piccola, *It.*,—Kleines Rohrhuhn, *G.* An adult male and a young bird, size of nature, are represented; the figure of the male is exquisite. The Little Zapern has only been met with two or three times in this country, but is common in the eastern parts of Europe; more rare in Holland and the north of France. Frequents marshy tracts, but also sometimes higher grounds. It dives with ease, and can remain under the water a considerable time, with only the bill above the surface; it also runs with celerity amongst the rushes, but is very difficult to rouse, even with the assistance of dogs. Feeds on insects, slugs, seeds, and other animal and vegetable matters. Nidificates among reeds, on the broken stalks of rushes and various aquatic herbage, and lays seven or eight

oval-shaped eggs, yellowish-brown, with elongated marks of dark olive brown. Young birds are of a much lighter colour than adults. Mr. Gould believes the "Olivaceous Gallinule" and "Little Gallinule" of Montagu to be identical with the present species.

Common Kite, *Milvus vulgaris*,—Milan royal, *Fr.*,—Falco collacoda-furcata, *It.*,—Rother Milan, *G.* We must confess this plate does not please us; nay, in the somewhat tame figure we did not at first recognize the beautiful bird it is intended to represent. It can scarcely be said that any of the illustrations in the *Birds of Europe* are *bad*, and, comparatively with most other ornithological works, very few are indifferent. The Kite is equally, but sparingly, distributed over the British Islands; but is much less common than formerly. On the continent it has a wide range, appearing to inhabit all the well-wooded districts. The elegance of the aërial evolutions of this bird must be familiar to most of our readers, either by description or actual observation. "Its prey, which consists of mice, rats, leverets, young gallinaceous birds, ducks, reptiles, fishes and insects, is sought for while it is soaring in the air at a moderate distance from the ground, and is taken by a swoop so noiseless and rapid, that little or no warning is given of its approach; in this way it sometimes commits great havoc among young broods of poultry, pheasants, partridges, &c." The nest is constructed, early in the spring, of sticks, lined with wool and hair, in the densest part of the forest. The eggs, three or four, greyish white, spotted with reddish-brown. Sex and age effect no very remarkable changes in the appearance of the Kite. The figure, of an adult, is three-fourths of the natural size.

Lapland Longspur, *Plectrophanes Lapponica*,—Bruant montain, *Fr.*,—Lerchin Sporner, *G.* It is not at present known whether the adult male of this species loses its strikingly contrasted colours in winter or not. The Lapland Longspur breeds within the arctic circle, but it passes southward in winter, in Europe as far south as Switzerland, and in America visiting the northern parts of the United States. Dr. Richardson informs us that the nest is "placed upon a small hillock, among moss and shrubs, and is composed externally of the dried stems of grass, interwoven to a considerable thickness, and lined very neatly and compactly with deer's hair. The eggs are usually of a pale ochre yellow, spotted with brown." Its food consists of the seeds of mountain plants, &c. It appears to be an almost exclusively terrestrial species, from the circumstance of the British-killed specimens having been met with amongst vast quantities of Larks in the London markets. The females and the

young of both sexes are destitute of the varied plumage which characterizes the adult male. The plate represents an adult male and a young bird of the year, pleasingly executed, of the living proportions.

An adult male, natural size, of the Hawk Surn, *Surnia funerea*, —Chouette caparoch, *Fr.*,—Habichts Eule, *G.* A beautiful figure. The habitat of this bird extends throughout the arctic regions of both continents, and it occurs in France and Germany, but not in England. The Hawk Surn is often seen abroad in the day time; and this, in conjunction with its habits and structure, points out the passage effected between the Harriers and the typical *Strigidæ* by this species. It builds in trees, and lays two white eggs. The sexes offer no material difference.

Common Serin, *Serinus flavescens*, Gould,—Grosbec serin, *Fr.*,—Girlitz, *G.* We perfectly coincide with our author in the expediency of removing the Serin from the genus *Fringilla*. The native habitat of the Common Serin is limited to the south of Europe, in many parts of which it is very abundant, frequenting the margins of rivers and lakes, especially where the Willow and Alder abound. "It is also common in copses and orchards, where it breeds, making its nest, which is of small dimensions, in low trees and bushes, of vegetable fibres and grasses lined with wool." The female and young want the yellow on the forehead. Beautiful figures of this elegant little species are supplied in the plate before us.

Common Wigeon, *Mareca penelope*,—Canard siffleur, *Fr.*,—Anatra marigiana, *It.*,—Pfeif Ente, *G.* Lovely figures of the male and female, rather under the natural size. The Wigeon abounds in our lakes and rivers in winter; also occurs in considerable numbers in the lowlands of the continent. It is a vegetable feeder, nibbling the grasses, &c., on which it subsists, near the surface of the water. Although most of these birds take their departure for the north in spring, a few stragglers probably remain and breed in this country. Lays eight or ten dull greyish-green eggs. It is impossible to mistake the sexes.

Blackheaded Xeme, *Xema melanocephala*—Mouette à-capuchon-noir, *Fr.* An individual is very well figured, natural size. In winter the jet black on the head, characteristic of the species, changes into white. Common in southern Europe, especially along the shores of the Adriatic; also abundant in Dalmatia, in the marshes, on which it breeds. Feeds on small fishes, slugs, and marine insects.

We next find excellent figures of a pair of Cirl Buntings, *Embe-*

riza cirlus—Bruant zizi, *Fr.*—Zivolo nero, *It.*—Zaun Ammer, *G.* Hitherto, we believe, the Cirl Bunting has been supposed to be entirely confined, in England, to the southern counties; but we are happy to be enabled to extend its range as much further to the north as Doncaster, an individual having been shot, about five miles from that town, in the spring of 1837. Inhabits the south of Europe generally, and resembles the Yellow Bunting in habits. The nest, constructed of dried grass intermingled with vegetable fibres, and lined with hair, is placed beneath a low bush, or at the foot of a low tree. The eggs are of a rounder shape than those of the Yellow Bunting, and grey, marked with dark zigzag lines. Feeds on grain and insects, especially grasshoppers. The female has no black on the throat.

Green Cormorant, *Cormoranus cristatus*—Cormoran largup, *Fr.* An adult in the summer garb and a young bird are figured; the latter is especially good. This species is easily distinguished by the intense green colour of the body. Inhabits the north of Europe, and as far south as the shores of the Mediterranean. Frequents rivers and rocky sea-coasts, and feeds on fish. Constructs its nest on the upper ledge of some bold precipice, forming it of dried sea-weed; the eggs, from two to four in number, are "of an oblong shape and white colour, with a rough calcareous surface. The young are at first quite naked, but are afterwards covered with black down. The young of the year are of a much lighter hue than adults.

Spectacle Fauvet, *Ficedula conspicillata*—Becfin à-lunettes, *Fr.* The plate represents, in an admirable manner, a pair of these birds, which much resemble the Whitethroated Fauvet in appearance and habits. Spain is the only recorded locality for its occurrence, and the nidification is unknown. The plumage of the female is paler than that of the male.

This Part of the *Birds of Europe* closes with a fine representation of the Black Cormorant, *Cormoranus graculus*—Cormoran nigaud, *Fr.*—Krahen Pelikan, *G.* Mr. Gould is convinced that this species has no claim to a place in the British fauna. According to Temminck it inhabits Holland, and enjoys a wide range through the northern latitudes of both worlds. It is migratory in eastern Europe, but Mr. Gould has never met with specimens from the localities assigned by the Dutch professor. "The plate represents an adult bird, about three-fourths of its natural size, assuming the white dots and crest of the breeding season."

CONTRIBUTIONS TO THE BOTANICAL GEOGRAPHY OF THE SOUTH OF EUROPE.

By Professor Link.

The Flora of a country constitutes one of its chief characteristics: to ask why a plant occupies this or that locality, is to ask why the Crow has not the plumage of the Peacock. It is not easy to find plants which characterize the longitude of a place, as well as its latitude and altitude. Those must be selected which are widely distributed, viz., those which Humboldt calls social plants, which are not readily propagated by means of their seeds—as these may be easily conveyed from one country to another—and least of all those which grow amongst corn. Our beautiful corn-flower (the *C. cyanus*), which ornaments our northern fields, I, however, once found in Portugal. And when even the selection be made, it is requisite to have been long or frequently in a country to define with accuracy the limits of a plant.

It is a well-known fact that many, but not all, of the plants of the northern plains are found in the south, upon the mountains; and although such plants may very conveniently indicate the climatic analogies of mountains, yet they cannot be applied to the determination of the climatic analogies of plains whence, at all events, we start. They likewise must ascend mountains by degrees, and not make the extraordinary leap of the Sandthorn, *Hippophæa rhamnoides;* for we can travel from Rügen to Geneva without finding it but at those two places. It is fortunate when the characteristic plant is so well known as not to require accurate botanical knowledge to make the requisite determination. The Common Whortleberry, *Vaccinium myrtillus*, is a plant well adapted to indicate the elevation of the surface. It grows in northern Germany, in the woods of the plains. It then gradually ascends. At Friburg, in Baden, it is found only upon the higher mountains; in Switzerland, which itself is much elevated, it grows in the woods of the first range of Alps, and is then again not found until we reach the high *Alpe di Caporagheno*, above Fivizzans, where it grows in the meadows with *Colchicum autumnale*. It was there met with by my deceased friend, Fr. Hoffmann, who visited the spot shortly after me. And, lastly, it is only again to be found upon the elevated Majella, in the Abruzzi.

But we will return to the plains, and there observe the plants which

form the vegetable line of demarcation of the south of Europe. After having entirely left the Alps, we observe an universally-known plant, the Lavender, *Lavendula spica*. It is found upon the sunny hills around Verona; it is very abundant beyond Coni, towards the Colde Teuda, there following the chain of mountains. It thence passes to the south of France and Spain, where, in Arragon, it is still abundant; but lower down, in the plains of Castile, it is not found, nor does it present itself in Portugal. It likewise terminates near Rome, and appears only on the high mountains on the coast of the Adriatic. It is not an eastern plant; in Istria its place is supplied by the *Salvia officinalis*, which there follows the Monte Maggiore, but which in Italy grows only on the high mountains of the Abruzzi.

The plains of Lombardy form a garden where scarcely a wild plant grows, at all events not one that is at all characteristical. Thus, also, the whole of the hilly Istria is covered with plantations of Olives; and it is only between these that it is observed that the region of Myrtles commences. The Myrtle, hence, is the shrub which follows the south. It covers whole districts in Portugal, and by the side of brooks, especially, it becomes a tall and beautiful plant. It thence passes on through central and southern Spain, the most southern part of France, as far as the coasts of Genoa. It is everywhere found in the papal states, and around Naples, and occupies the whole of Istria, as far as Monte Maggiore. It, indeed, stretches further south, but becomes gradually more rare; and in the north of Italy it is only seen in solitary situations. Further towards the south, on passing the land of Myrtles, we come into that of the Rosemary, or, more precisely, of the Oleander. It commences near Merida, in Spain, follows the course of the Guadraria as far as Agamonte, where formerly the good King Jargatai reposed in a grove of Laurels; it then fills the valleys of Algæra with its beautiful blossoms, whilst the Serra di Monchique is studded with the flowers of the *Rhododendron pontificum*. It is only found in the hot valleys of Calabria and Sicily. When along the road to the ancient Troeza, after having wandered in the Morea for many leagues, beneath a burning sun, over arid waterless mountains, but sparingly sheltered by solitary and not high wild Pear trees, *Pyrus cuneifolia*, it refreshes the weary and thirsty traveller to behold a long stripe of Oleanders in the distance, twining around the mountains, with solitary plaintains rising above it; for he is sure to find there a brook to quench his thirst, and the Plaintains promise a re-invigorating shelter. These are the three vegetable regions of the south of Europe, in their order of succession from the north to the south. We will now turn to the lines

of demarcation from the west to the east. It is not difficult to find plants which indicate these divisions, for the Pines and Oaks readily supply them.

The *Pinus sylvestris* does not pass the alpine peaks towards the south, nor does it present itself beyond the Rhine to the west; that is to say in its wild state. Plantations of it have frequently been formed in France. A large and beautiful tree, which is disfigured only by its grey green leaves, the Pinaster—*Pinus pinaster*, Lam.; *P. maritima*, De Cand.—forms the large forest of Leira, in Portugal, but which Don Diniz planted from indigenous seeds. It is of a very different appearance to the German Fir—for it forms a pyramid, and not a crown; the branches spring at right angles from the stem, and the leaves are very long, and dark green. It stretches itself throughout the whole of Spain as well as the south of France in the vicinity of the Mediterranean, as far as the coasts of Genoa, both di Ponenti and di Levante. It is recognized by the form of its extended branches; but it soon terminates, and in its place we find the Pine of Aleppo—*Pinus halepensis*—as it is called by botanists who have adopted the very laudable principle of altering no name, however incorrect it may be. Its long and extremely delicate leaves sufficiently characterize this tall and beautiful tree. It belongs to Italy, and indeed to its plains; but a different and equally beautiful Pine occupies the mountains, with which we have not been long acquainted, the *Pinus Lariccio*, which is found upon the mountains of Corsica, Calabria, and upon Etna, of about the size and height of the Red Fir, *Picea excelsa*. It was formerly found upon the lower mountains of Italy, on the coasts of Genoa; for Strabo says wood is felled there for masts, it is exported, and in lieu they receive oil which is not procured at Genoa: it has now become precisely the contrary. Some few years back, when the ground was removed for the foundations of the Carlos Theatre, at Genoa, Pine-apples were dug up, one of which Viviani, of Genoa, showed me, and it agreed exactly with the Pine-apple I had brought from Etna.

Further towards the east, we meet with the Grecian Pine, *Pinus maritima*. This is not a high tree, but it has a beautiful crown and long bright green leaves, and this colour distinguishes it very strongly from all the other species of Pine. I have found it wild nowhere but in Greece. It is very numerous in ancient Attica. From the Acropolis there is seen in the distance, upon the sacred road to Eleusis, a wood consisting of these trees, but which has now become much opened. These woods are also seen upon Hymettus, also upon the promontory of Sunium. In going from the hilly plains of

Megara to Corinth, the road suddenly rises towards the Isthmus, and we enter a forest of these Pines. On the right rocks rise; and the mountains, up which the road winds, become higher and more precipitous. The narrow arm of the sea and bay is almost closed by the island Salamis, which, now deserted and uninhabited, lifts up its innumerable mountain peaks. The road hangs over the sea, upon the edge of a lofty precipice, and would create giddiness did not a friendly hedge of Mastic protect from danger as also its apprehension, and permit us to enjoy without anxiety the beauties of the prospect. The traces of walls are still seen amongst the rocks. Here dwelt, in remote antiquity, the bandit Pityocampos, who bound the unfortunate wretches that fell into his hands between two Fir trees bent downwards together, and killed them by this dreadful death. This story is not improbable; for those Firs are low: with ours it would have been impossible.

In the Morea this tree is not numerous, and it is found only upon the northern coasts. The valleys of Epidaurus are adorned with it, as are also the mountains of Ægina. It is most beautiful at the foot of the elevated Cellene towards the sea, and upon the rough banks of the river Xylocastro, which falls down from the mountains, it becomes a beautiful tree with a broad crown. On the southern coast of the Morea it is rare, and the western coast is occupied by the *Pinus halepensis*.

The three Pines—*P. Pinaster*, *P. halepensis*, and *P. maritima*—characterize three regions of southern Europe, from east to west: and the same is the case with three Oaks. In Spain and Portugal is found the Oak which bears edible acorns, and which was well known to the ancients. Desfontaines re-discovered it upon the mountains of Algiers, and called it *Quercus ballota:* and Count Hoffmannsegg and myself were the first to inform botanists that it grows in Spain and Portugal; but that, for the sake of its fruit, it is cultivated near Pontelegre, in Portugal, in forests, and these acorns are roasted with chesnuts and sold at the gates of Madrid. In Italy a different Oak is found, with edible fruit, and which M. Zenore, singularly enough, considers a variety of our Oak, *Quercus pedunculata*. And in Greece, lastly, we find the *Quercus ægilops*, the tall, slender, and beautiful *Vellanida*, the Arcadian Oak, the fruit of which the ancient Arcadians—the βαλανίφαγοι ἄνδρες of the Pythia—eat, and the cup of which, by the name of "knopper," is carried to Germany. The last is the Oak which bears the gall-nuts, *Q. infectoria*. It first presents itself on the eastern edge of Greece, and becomes abundant in Natolia.—WIEGMAN'S *Archiv.*, 2, 4, 328.

REMARKS ON MUSICAL PRECOCITY.

ILLUSTRATED WITH CASES.

By J. L. Levison.

If I had the technical knowledge of music possessed by the talented writer of the article "On the Present State of the Opera," in the last number of *The Analyst*, I might hope to render this paper more generally interesting. I shall, however, only give a notion of the cerebral organization of some prodigies as infantile professors, with the intention of adding my mite to our psychological information. In order to render my thoughts practical, I propose examining the following propositions: that, in most cases of an early manifestation of musical talent, there are larger anterior lobes than in commonplace children; and that, in the cases of musical precocity which I have investigated, there have been observed two conditions, 1st. That the parent or parents have been themselves musical; 2nd. That all the nervous energy, or, as it is termed by physiologists, the sensorial power, is abstracted for the purpose of developing faculties predisposed to activity, and others are deprived of the nervous stimulus.

I select the three cases which follow, as illustrating my views. 1st. Master Phillips, called "The Infant Trumpeter;" 2. Master Shaw, a juvenile organist; 3. Master Manton, usually announced as "The Infant Paganini."

REMARKS ON THE CEREBRAL ORGANIZATION OF MASTER PHILLIPS.

I took the phrenological development of Master Phillips a short time since, whilst on a visit at Hull, and previously to hearing him perform. He is about ten years old, thin and pale, being of a nervous temperament. His head is above the average size, and the anterior lobes are deeper than broad—that is, they possess greater length than breadth of fibre, particularly in the reflective region. But the lower portions of the middle lobe, and part of the posterior lobes, have breadth as well as length; or, in other words, the feelings are large which impart energy to the character and give greater vividness to combinations of the intellectual faculties, so as to *individualize* a person for any specific or particular talent. The organs

of Combativeness, Destructiveness, Secretiveness, Constructiveness, Self-esteem, Love of Approbation, and Firmness, are very large; as are also most of the organs of the moral group, and many of the intellectual faculties. Taking a front view of the forehead, the lower and outer portions seem contracted, owing to the upper and lateral portions being so much expanded; but a profile view shews a greater proportion of brain before the ear than there is behind it. His chest is rounded and full, arising from the particular action of the pectoral and intercostal muscles, and their long-sustained activity; but the abdomen is small.

Having thus given some idea of the cerebral and bodily organization of Master Phillips, we may proceed to treat of his intellectual qualifications, which are in accordance with the former, and may be anticipated by even the tyro in Phrenology.

He plays the trumpet with apparent ease, and seems nothing daunted, whatever may be the number of his auditors. He takes applause as a matter of course, but it does not seem to puff him up with pride, although there is no doubt that the great admiration he receives acts as a powerful stimulus to Love of Approbation, giving him the peculiar smile which this latter feeling imparts when circumstances excite its activity. Nor must we wonder if such a child should experience something like vanity, when we reflect that even the matured philosopher is not proof against it, particularly when he is made the *lion* of his day. Master Phillips's performance as a trumpet-player is astonishing, considering his age; and he has excited surprise and admiration everywhere, not only among amateurs, but also among professors of music. The combination of the faculties essential to the musician are, some of them, above the mean average of his other perceptive powers. The organ of Time is very large, and Melody, Order, and Number, are full; whilst Imitation, Ideality, and Constructiveness, are very large. There is one peculiarity in the forehead of this child; the organ of Comparison is so very large that it imparts a singular and particular expression. And I have observed that when any of the mental faculties are in excess, they impart to the mind a something which indicates that they influence the character. But as the education of Master Phillips had been neglected, if we except the culture of his musical faculties, I confess that it puzzled me very much to conjecture how Comparison would manifest itself in him. When, however, I heard him play a concerto, with variations, it was no longer a marvel to me, because the powerful influence of Comparison was indicated in the variations, which were played with great taste and discrimination, pre-

serving distinctly the original air, and never sacrificing the rules of harmony and melody for any clap-trap temporary applause. Mentioning these observations to his father, he told me that, when a mere child, he would immediately detect the resemblance of airs (if there existed any) of different composers, and he would point out the exact difference between them; and when his infantile mind could not express its thoughts in words, he would whistle first the one air, then the other, and, with a quickness of gesticulation and pantomimic language, call attention to any actual or supposed resemblance between them.

MASTER SHAW,

ORGANIST TO ST. PETER'S CHURCH, DRYPOOL, HULL.

Master Shaw is robust, but small in stature, being fifteen years old. He has rather a large head, and his temperament is nervo-sanguineous. At the present time he is a pupil under Mr. Skelton, a very talented musician. He plays on the organ with taste (Ideality is large); his execution is excellent (Imitation is large); his manipulation is surprising for one so young (Constructiveness is very large); and he has an excellent moral organization, with large Self-esteem, Love of Approbation, and Firmness; and, even when singing before large audiences at the Hull concerts, he is never abashed. Master Shaw gives evidence of the accuracy of his perception of melody that he is quite an improvisatore, astonishing those who hear him with the sweetness, power, and harmony he displays when performing the voluntary.

MASTER WILLIAM MANTON,

COMMONLY CALLED "THE INFANT PAGANINI."

This child is not quite six years old, of a nervo-bilious temperament, and with a head which is much malformed in the lateral and posterior regions, but, as in other cases of precocity, the anterior lobes are large. The sentiments and feelings are also strongly developed, particularly those which give confidence, taste, skill in execution, and the power of expressing the thoughts of a composer. The organs of Self-esteem, Love of Approbation, and Firmness, are very large, as are also Constructiveness, Ideality, and Imitation; and Order, Number, Individuality, and Eventuality, are very large: Time is full.

Master Manton is travelling with Mr. F. A. Beverley, vocalist

and guitarist, and he plays on the harp and violin. I attended a "Musical Melange," and was delighted with the little premature performer. He played the Cuckoo solo, and also St. Patrick's Day in the Morning, on one string *(à la Paganini)*, and an air on the harp, with variations. It was a feeling of surprise and admiration we experienced when watching this little boy run his puny finger along the strings of the harp, and bring out the tones with great skill, considering his tender age. It was, however amusing to see this little fellow, at the conclusion of each stanza, give the *Paganinian* shake of his bow with all the proud consciousness of superiority, and with as much an air of triumph as the mighty Italian himself, whose flourish of the bow seemed to indicate that he was the prince of violinists and a musical magician.

I should deem it a comparatively profitless task to trouble your readers with these little sketches of the musical triumvirate I have named, if I did not hope to make their history a means of explaining my own thoughts on musical precocity. From many observations I have made, the early development of a genius for Music or Painting may be referred to hereditary influence imparting a tendency to some organs to become more active than others, and to the circumstances in which such supposed prodigies are placed. The circumstances sometimes may appear to be adventitious means of developing their innate tendencies, or certain plans may be made to call forth and foster any indications of particular talent. It may further be stated, that in most instances of early genius the sensorial power is concentrated and engrossed by a few faculties, to which it imparts an unhealthy energy. In Master Phillips's case, we have seen that his mental activity is in one direction, and hence his powers of musical perception and of the relative duration and intensity of sounds. His history confirms my opinion that his particular bias is referable to causes preceding his birth, and from others in subsequent operation, which conjointly rendered him a genius. The proofs I offer are these: his father was master of a band and played on many instruments, having quite a passion for music:* he would therefore impart a tendency to the faculties of Melody, Time, &c., and predispose them to be susceptible of being easily excited; and when the child "breathed the breath of life" music was used as a means of amusement. But the discovery that the baby musician

* By passion I mean a very high state of excitement of particular powers, arising from excessive activity and great stimulation.

preferred the trumpet to every other instrument may almost be regarded as accidental. This was ascertained by the fact that when he was crying no other music would pacify him—that a few notes from the trumpet would have a magical effect in stopping his unmusical screaming; and by this means only his sorrow or anger was changed to joyous mirth and unrestrained expressions of pleasure. He would listen to this instrument not only with evident satisfaction, but with some symptoms of abstraction. Yes, so great was his love for the "war-stirring sounds" of the trumpet, that when tired, cross, and nearly asleep, he would be immediately roused by its shrill notes, and appear lively and excited. After many such experiments, Mr. Phillips determined to cultivate his interesting child, and encourage his particular predilection. For this purpose he used to play for hours on the favourite instrument, and the young pupil listened and smiled, and imitated as well as he could the notes or the air. It was in this way that the child was educated for a musician, and expended all the energy of his mind (the sensorial power) on this one pursuit, which has rendered his organs of Melody, Time, &c., active and vigorous.

In the case of Master Shaw there is similar evidence of his receiving a musical bias from his father, who not only had a decided taste for music, but had cultivated it to such a degree as to be considered respectable in the art, and is now principal bass singer at the High Church, Hull. His son had, therefore, a musical tendency transmitted to him by his father; and as the boy's taste for music was early manifested, every opportunity was taken to cultivate it. I may further remark, that it does not appear to be a mere matter of accident or caprice the choice which infantile professors make as to the kind of instrument or the composition they show a preference for. Phillips's organization makes him delighted with martial music, and Shaw's with sacred music; the one evinced, even as a baby, an extreme pleasure for the trumpet, and the other for the organ.

If the cases of Phillips and Shaw confirm my views, there is still more coroborative proof in the personal history of Master Manton. His father, I am told, is a musician, and had brought up another son to be a public performer on the harp. But probably charmed with the immense fortune which Paganini was receiving, he was determined to make little William eminent on the violin. Be this as it may, it is a matter of fact that little Manton, even from a baby, was in love with "the harmony of sweet sounds;" and all his mental energy was directed to this one object. William Manton is

very clever for his age, but he has been entirely neglected in his education; and I am informed that he has been exhibited, night after night, at public houses and taverns. Very often, moreover, when tired and worn out, he has been roused from his sleep and put upon a table to play to the company resorting to the above places of entertainment; and his health has materially suffered from such unnatural stimulation of the brain. To give some idea of the exercise he has had, I may say that he will tell any note of any string struck; and such is the nicety of his perception, the accuracy of his judgment, and his knowledge of the relative duration of musical notation in the most complex composition, that he instantly detects any violation of melody and the slightest discrepance in the harmony of it.

But although it is pleasing and astonishing that a young child not six years old should play on the harp and violin with admirable taste and correctness, we must regret that such perfection can only be attained at the expense of health and the neglect of all or most other intellectual pursuits—pursuits which are more important in point of utility, and which render men useful in their generation.

In conclusion, I would observe that if any boy, with a good temperament and large anterior lobes, had the musical group early and constantly cultivated, and if care was taken to select the kind of composition suitable to the organization of the individual, there is no doubt but that he would manifest that degree of talent for music which constitutes genius. Hence we arrive at data for making musical prodigies. We have only to give exclusive attention to the child, and concentrate the nervous energy of the brain (the sensorial power) to the perception of sounds, their relative duration, and their comparative intensity; and if our pupil is the child of musical parents it would be so much the better, and would expedite the results we have anticipated. It is true we admire such talented children; but I repeat that the distinction is purchased at a very dear price—the loss of health and of general and useful knowledge.

UPON FOSSIL INFUSORIA.

By C. G. Ehrenberg.

M. C. Fischer, the proprietor of the manufactory of porcelain at Pirkenhammer, near Carlsbad, has observed that the substance resembling siliceous concrete, which occurs in the peat bogs near Franzensbad, in Bohemia, consists almost exclusively of the armour of some species of *Naviculæ*.

Together with this information, M. Fischer sent me a piece of the siliceous mass, about 2″ long, 1″ broad, and $\frac{3}{4}$″ high, as well as some specimens of the peat, intreating me to ascertain the animal, and to publish the result. Microscopic inspection immediately confirmed the discovery of M. Fischer, that the siliceous concrete (kieselguhr) of Franzensbad consisted almost exclusively of very well preserved *Naviculæ*, with which other *Bacillaria* were intermixed; and the perfect transparency of their siliceous armour, and its purity from all organic matter, renders it probable that an unusually intense heat had purified them and amassed them together. It is improbable that they should have originated at the bottom of the sea; for the majority of the animals, both in form and the relative numbers of their striæ, correspond very accurately with those of the *Nav. viridis*, which is found in all the fresh-water about Berlin, as well as elsewhere. In the specimens of peat I could also recognise *Naviculæ*, yet they were generally different, though still existing species, fewer in relative proportion, and the prevailing forms very different.

Original specimens of the siliceous concrete (kieselguhr) of the Isle of France and of Santa Fiora, in Tuscany, which were analyzed by Klaproth, shewed that they likewise consisted almost exclusively of the envelopes of infusoria of several genera of *Bacillaria*, yet sometimes of the same and almost all still living species, in conjunction with rare siliceous spicula of fresh and sea-water sponges, without any intervenient binding material. This, therefore, is an additional confirmation of Kühzing's discovery, that the armour of the *Bacillaria* consists of silex.

I myself discovered, several years ago, that the ochraceous slimy substance which sometimes covers the bottom of marshy brooks and moats, and which appears to have been considered as a deposit of the oxide of iron, is a very delicate *Bacillaria*, which, at a red heat, becomes red like the oxide of iron, and contains much iron, but does not

lose its form either by a red heat or upon being treated with acids, and, consequently, possesses siliceous armour most approximating to that of the genus *Gaillonella*. I therefore figured it last year as *Gaillonella ferruginea*, in plate ten of my *Infusorien Codex*, which will now soon appear. The above circumstances make it probable that *G. ferruginea* played an important part in the formation of bog iron, either by the direct amount of its own iron or by the attraction of all in its vicinity.

The following are the fossil species of infusoria which I have detected in the above-named substances :—I. In the siliceous concrete (kieselguhr) of Franzensbad: 1. *Navicula viridis* of very different sizes, the largest $\frac{1}{5}''$, forming the major part of the mass; 2. *N. gibba;* 3. *N. fulva;* 4. *N. Librile;* 5. *N. striatula;* 6. *N. viridula;* (the last two are salt-water animals, all the first are inhabitants of fresh water); 7. *Gomphonema paradoxum;* 8. *G. claratum;* 9. *Gaillonella varians?* all fresh-water animals—none to be distinguished from the living species. II. In the peat of Franzensbad: 1. *Navicula granulata* is the most numerous, and was hitherto unknown; 2. *N. viridis,* rare; 3. *Bacillaria vulgaris?* 4. *Gomphonema paradoxum;* 5. *Cocconeis undulata;* all living forms—the last found in the salt water of the Baltic. III. In the brugmehl of Santa Fiora: 1. *Synedra capitata,* forming the chief mass—an hitherto unknown form; 2. *S. ulna;* 3. *N. Librile;* 4. *N. gibba;* 5. *N. viridis;* 6. *N. capitata;* 7. *N. zebra;* 8. *N. phœniceutron;* 9. *N. inequalis* (all still living in fresh water); 10. *N. viridula;* (found still in salt water); 11. *N. granulata;* 12. *N. follis* (unknown species); 13. *Gomphonema clavatum;* 14. *G. paradoxum;* 15. *G. accuminatum* (all still found in fresh water); 16. *Cocconema cymbiforma* (a still existing fresh-water animal); 17. *Cocconeïs undulata* (still found in salt water); 18. *Gaillonella Italica,* n. s.; 19. the siliceous spicula of a *spongia* or *spongilla.* IV. Klaproth's siliceous concrete (kieselguhr) from the Isle of France, exhibited, 1. *Bacillaria vulgaris?* constituting the chief mass; is still found everywhere in salt water; 2. *B. major* (an unknown species); 3. *Navicula gibba* (still living, both in fresh and salt water); 4. *N. alia* (sp. undetermined); 5. *N. bifrons:* all these species are not so well preserved as those in the former stones, and appear, with the exception of the latter, to be salt-water animals.

The majority of these fossil infusoria are still found living near Berlin and in the waters of the Baltic, near Wismar. The greater number are so well preserved that they may be closely inspected. Thus, for instance, it is not only possible to count the number of

the ribs, but also the six apertures of the armour of *Navicula viridis*, the four apertures of *Gaillonella*, the two apertures of *Gomphonema*, &c. The stone of the Isle of France only appears to contain a preponderance of salt-water animals. The few yet unknown forms may be considered very appropriately as still existing, although yet undiscovered, animals. What is most striking, is the preponderance of individual species which thus characterize the different stones; for instance, the *Navicula viridis* in the siliceous concrete (kieselguhr) of Franzensbad, *Bacillaria vulgaris* in that of the Isle of France, and *Synedra capitata* in the pulverulent silica (bergmehl) of Santa Fiora. The still existing ones are more mixed, and live only about and upon plants, on which they feed.

Purchasable foliaceous tripel (Blätter tripel) likewise shewed that its mass equally consisted of infusoria. The polishing slate of Bilin, in Bohemia, which forms entire beds, I have discovered to consist almost exclusively of infusoria, which may be ascribed to the genus *Gaillonella (G. distans)*. *Podosphenia nana*, n. sp., *Navic. scalprum?* and *Bacillaria vulgaris* (the last are still living salt-water animalculæ), present themselves only occasionally; the first alone is sometimes in equal abundance with the *Gaillonella*. There are found in the same polishing slate the impressions of plants and an extinct species of fish—*Leuciscus papyraceus* of Bronn, according to Agassiz. In the adhesive slate of Menilmontant I found but thin doubtful traces of the altered *Gaillonella distans*. An individual of this species, which forms, almost without any connecting substance, the polishing slate, is $\frac{1}{200}'''$ large; many are smaller, and one cubic inch of this stone contains 41,000,000,000 (! !—Ed.) of these animals.

EDUCATION, AS IT IS AND AS IT SHOULD BE.

"Phrenology is a science, without which the attempt at education must ever be totally futile and unsuccessful, and its pretence nothing more than a bitter satire upon human ignorance, folly, and presumption."—TOULMIN SMITH.

IT would be difficult to point out a subject of greater interest to the philanthropist than education; and, whether considered as a duty or a pleasure, it is a subject which should occupy the foremost place in the thoughts of every one who looks forward with delight to the improvement of his species. It is a subject, however, which has hitherto been left to a degree of neglect proportionate to its merits; and although appeals have, during the last few years, been made to the public, these have been like a voice in the wilderness, and there has been little apparent progress in forwarding the cause. However, I consider it to be the duty of every one to apply himself to the removal of the errors which compose that curious system usually called a liberal education; and, accordingly, I now propose to lay before the reader a sketch of the way in which education might be conducted with a certainty of successful results, and with equal pleasure to teacher and pupil. This has been done many times by men of note; but by various means the required impression has not been made; the books of Locke, Kames, and Pestalozzi, lie on the shelf: they are praised by the tongue, but are forgotten in practice. This has, no doubt, in some measure, been owing to the want of some system by which the truth of their precepts might not only be enforced, but also *demonstrated*. I, accordingly, shall now draw an outline of "education as it should be;" and as my principal object is to *enforce the ideas* I shall promulgate, I shall in every case, where practicable, convey these in the words of some great author; for I know that the organ of Veneration is usually at least as active as Causality: and I have frequently observed, with pain, that an idea which is scouted when propounded in plain terms by an humble individual, will elicit applause and gain assent when dressed in elegant or eloquent phrases, and backed by some great authority. So much more active are the *feelings* than the *reflective powers* in the generality of mankind!

All the ideas which I shall now gather I have myself expressed long before I had access to any of the authorities which I shall have the pleasure of quoting for the advantage of my readers.

Education may be defined, the science which teaches us to cultivate the faculties with the greatest advantage, to strengthen the weak, moderate the over-active, and to combine all into one harmonious whole. It was formerly a frequently-agitated question whether general education was a beneficial thing; but the very form of the question is founded in error; for every human being is of necessity educated; and it is as impossible to withhold education from the mass of mankind as it would be to deprive them of air.

The word education is derived from *e* out and *duco* to lead; and thus simply signifies leading an organ out by exercise. One who lives among those who habitually drink to excess has his organ of Alimentiveness educated; one who lives in combative company will have his Combativeness educated, and so on; and in this way all the forty organs are educated according to the circumstances in which the individual finds himself. The pickpocket and the poacher are educated equally with the university youths, and the education in these cases, as in every other, commences at birth. The question, therefore, as an able writer has lately said, is not between education and no education, but between a good education and a bad education.

Education may be divided into two distinct heads:—1st, the *manner* of instructing, and 2nd, the *matter*. This distinction is very generally overlooked, in consequence of which very disastrous results ensue. "The *manner* of giving instruction," says Mr. Owen, "is one thing, the *instruction* itself another, and no two objects can be more distinct. The worst manner may be employed to give the best instruction, and the best manner to give the worst instruction." I am afraid that it is too frequently the case to find the worst manner and matter combined. This can only be attributed to the incapacity of the teacher; and therefore, before entering on either the manner or the matter, it will be necessary to give a few directions, indispensable for parents to attend to in the choice of a teacher.

"Seek you to train your fav'rite boy?
Each caution, ev'ry care, employ;
And, ere you venture to confide,
Let his preceptor's heart be tried;
Weigh well his manners, life, and scope:
On these depend thy future hope."

In following this advice, Phrenology will be a most effectual aid. This science shows us the reason why some teachers succeed while others fail, and it likewise gives us a key by which we may discover the competent and discard the incompetent without any loss of time or money. Philoprogenitiveness is one of the organs indispensable to the teacher. Combe remarks on this organ as follows:—"The natural language of the faculty is soft, tender, and endearing. *It is essential to a successful teacher of children.* Individuals in whom the organ is deficient have little sympathy with the feelings of the youthful mind, and their tones and manner of communicating instruction repel, instead of engaging, the affections of the scholar. This is the cause why some persons, whose manner, in intercourse with their equals, is unexceptionable, *are nevertheless greatly disliked as teachers;* and children are generally in the right in their antipathies, although their parents and guardians, judging by their own feelings, imagine them actuated by caprice."

Every one who has had the slightest experience in the subject must feel how exquisitely true to nature is the foregoing description. Emphatically it may be said—their tones and manner of communicating instruction *repel,* instead of engaging, the affections of the scholar. And yet the parent sees nothing of this, and the poor pupil is obliged to toil wearily on, like the panting Hart on the parched desert, with not even a patch of green to refresh the aching sight.

There are other faculties equally indispensable for a successful teacher. Mr. Combe enumerates them as follows:—"Individuality, Eventuality, and Concentrativeness, are indispensable qualities to a good teacher. *I have never seen a person capable of interesting children and exciting their intellects who was deficient in both the first and second.* The manner of a teacher thus deficient, is vague, abstract, and dry, and altogether unsuited to their mental condition. These three organs large, combined with large Philoprogenitiveness, Benevolence, and Conscientiousness, and an active temperament, constitute the leading elements of a good teacher."

This passage agrees with my own experience. I have known a teacher labouring for years, quite unsuccessfully, to instruct several pupils of excellent dispositions and good capacities, and at the end they knew little more of the subjects on which so much labour and trouble had been expended than at the beginning. Before I knew Phrenology, I used to suppose, judging from the manner in which the teacher conducted his system, that he did not in reality wish to instruct, but to torment and irritate his pupils, and certainly he suc-

ceeded in this at least: but when I became acquainted with Phrenology—behold, the cause of the failure became as clear as the noonday sun!—he had the three first organs enumerated by Combe deficient. Another master, with whom I was acquainted, had not the slightest experience in teaching; but he was completely successful with the same pupils, who were always sorry to miss a lesson with him: in him the three organs were large. Another teacher possessed two of the organs large, namely, Individuality and Concentrativeness; but the third, and most important one (Eventuality), small. When he became acquainted with Phrenology, he said he felt the deficiency; but he added that he found that science of great assistance to him, for he read over carefully the functions of the deficient organ, and was thus in some measure enabled to supply its place: and, at any rate, he then saw how far he himself was to blame for any want of progress in his pupils.

But if all the three organs are deficient, Phrenology will be of little or no use to the individual; he cannot become a phrenologist, and consequently is incapable of being a teacher. Phrenology would be to him what manure is to the stony moor, and would only encumber what it could not enrich. If Causality is likewise deficient, as in the case of the first-mentioned teacher, his case is truly pitiable. He is as incapable of grasping the science in its breadth and depth, as a fly would be of taking in the proportions of St. Paul's; and to hide the threadbare state of his mind, he would be obliged to take refuge among the "illicit processes" and "undistributed middles" of routine logic.

An incompetent teacher is one of the greatest curses of mankind, and no language can be too strong to warn parents how they put their trust in one. If an architect, or a painter, or an actor fail, they are visited with severe criticism; and nothing can more forcibly show the backward state in which society yet remains, than the impunity with which a teacher can disgrace his calling. This will not, however, last long: Phrenology will render it impossible. Let every one expose any instance of the kind that may come under his notice, and the evil will vanish. "No effort is lost." Therefore let all exert themselves in the good cause, and by degrees our island shall be ridded of a race, compared to which the slaveholders were harmless. Children were intended by their Creator to enjoy their existence—

> "And yet how many weary hours
> Those joyous creatures know!
> How much of sorrow and restraint
> They to their elders owe!"

This leads us to the *manner* of the education, which we shall consider before we enter on the *matter*. Pestalozzi has some judicious remarks on this point. For instance: "If a mother is desirous of taking an active part in the intellectual education of her children, I would first direct her attention to the necessity of considering, not only what sort of knowledge, but in what *manner* that knowledge should be communicated to the mind. For her purpose the latter consideration is even more essential than the former; for however excellent the information may be which she wishes to impart, it will depend upon the mode of her doing it whether it will at all gain access to the mind, or whether it will remain unprofitable, neither suiting the faculties nor being apt to excite the interest of the child."—This is sound doctrine; more so than that of Mr. Owen, who exactly reverses the relative importance of manner and matter. Yet here, at the very outset, we find that the self-called Pestalozzians desert their master; for not a thought do they expend on the *manner:* they only consider what language or science, and what grammar or compendium the pupils shall use.

The most interesting subject in the world may be rendered dull, tedious, and tiresome, by the manner in which it is communicated. "There is," says Pestalozzi, "a remarkable reciprocal action between the interest which the teacher takes and that which he communicates to his pupils. If he is not with his whole mind present at the subject, if he does not care whether it is understood or not, *whether his manner is liked or not, he will never fail of alienating the affections of his pupils, and of rendering them indifferent to what he says.* But real interest taken in the task of instruction, kind words and kinder feelings, *the very expression of the features, and the glance of the eye*, are never lost upon children." These passages shew Pestalozzi to have been well-versed in the philosophy of human nature. To what extent Pestalozzi was acquainted with Phrenology I am not aware; he was born only ten years before Gall, and probably knew something of the greatest discovery ever made; but, however that may have been, he must certainly have possessed an organization well-calculated to acquire name and fame in the path which he had marked out for himself.

When many pupils have been educated together, and one or two do not keep pace with the rest, it is frequently said to be a most wonderful circumstance that, although all the pupils *have received exactly the same treatment*, two or three should be behind the others. Now if all the pupils *have*, as is boasted, received the same treatment, this,

of itself, would account for some having remained behind the others; but I flatly deny that they have received the same education. It may be very true that there have been the same number of hours in school, and the same books used, and yet the mode of education in the two instances may have been entirely different.

A pupil who has facility in acquiring that which his master teaches will be petted, and praised, and held up as a pattern of industry and good conduct, while another, whose organization happens to be fitted for other subjects, will be scowled at, and receive unworthy treatment; and yet the former may, in reality, have no merit at all, and the latter may have exerted himself to the utmost. An able writer well remarks, "The boy's merit must be measured by his powers, and the greatest judgment of the teacher is here requisite. *To do well when he may do well easily is every man's virtue.* Christ looked carelessly on while the rich Pharisees threw of their wealth into the treasury of the temple, but the widow's mite drew forth his cry of admiration; similarly, the boy's merit must be measured by his powers. *The reward is to him who labours, though he may labour in vain;* to him who struggles, though he may be overcome; in short, reward is the due of merit, *and more especially of that merit which has not already met its reward in success.*"

This, however, is an unknown tongue to the master, who all the while imagines he is pursuing precisely the same plan in both cases; whereas, in reality, he is, in the instance of the successful boy, pampering the organs of Self-esteem and Approbativeness; while in the other, who, in nine cases out of ten, is, in reality, most deserving of praise, he wounds these organs, and systematically educates his Combativeness, Destructiveness, Secretiveness, and Cautiousness, and at the same time weakens the three most valuable organs, Conscientiousness, Veneration, and Benevolence. This is the case with numbers of pupils who are thought to have received "every advantage," and who, though possessed of excellent organizations, are set down, both by parents and teachers, as wilful, headstrong, and incapable.

Those calling themselves Pestalozzians appear to me to have nothing in common with the great educator but the name. Pestalozzi maintains that "every plan of education ought to be based on a consideration of the nature or faculties of the child." Which among the Pestalozzians has acted thus? I question whether there are many who could tell what the faculties of the child are, much less the scope of each, and their combinations.

Again, the great educationist tells us, "A child is a being endow-

ed with all the faculties of human nature, but none of them developed, —a bud not yet opened. When the bud uncloses, every one of the leaves unfolds; not one remains behind. Such must be the process of education. *No faculty in human nature but must be treated with the same attention*, for their co-agency alone can secure success." Which of the Pestalozzians has been Pestalozzian here? Again:— "*The strictest attention should be paid to the shades of individual character and talent.*" Notwithstanding this especial injunction, the *Pestalozzians* make it a boast that all their pupils have received the *same* treatment! It is an injunction disregarded by general consent; not fifty Pestalozzis could have enforced attention to it: *nothing but Phrenology could do so.*

Now, however, we come to a point more important than the rest; one, indeed, which includes all the others. In an article of mine which appeared some time ago in *The Analyst*,* the following passage occurs:—"I think it may safely be affirmed that, if a pupil does not advance in his studies, or does not advance so quickly as he should, the fault is never his own;" and, after bringing proofs of this, I conclude:—"I contend, therefore, in every case in which the pupil remains stationary, or advances but slowly, the cause must be referred either to the ignorance of the teacher, or to the mal-organization of the pupil's brain." This was stigmatized by *Pestalozzians* as dangerous, &c. Judge, then, of my surprise when I met with the following passage of Pestalozzi:—"The *interest* in study is the first thing which a teacher, and, in the instances before us, which a mother, should endeavour to excite and keep alive. There are hardly any circumstances in which a want of application does not proceed from a want of interest, and there are, perhaps, none under which a want of interest does not originate in a mode of teaching adopted by the teacher. I would go so far as to lay it down as a rule that, whenever children are inattentive, and apparently take no interest in a lesson, the teacher should always first look to himself for the reason." Here is the same idea, in nearly the same words, by Pestalozzi himself! He even goes further than I did, for I divided the blame between the teacher and the organization; Pestalozzi throws it justly almost entirely on the former. I mention this to show how impossible it is that the mere dicta of any individual, however illustrious or successful, can place a subject like education on a firm foundation; for his followers, overlooking his precepts, will merely shelter their own ab-

* Vol. ii., p. 413.

surdities under his name, while a science is absolutely necessary for the elucidation of the subject, and that science is Phrenology, without which all systems of education must be empirical.

Education would indeed be a disagreeable and irksome occupation if the passage which the *Pestalozzians* were pleased to designate as "dangerous" were untrue. The best systems, and everything which ingenuity could suggest, might then be thrown away, all through the caprice of the pupil. But, no! the Creator has ordained that it shall be otherwise; and those who reflect at all on the matter will immediately perceive that, as Pestalozzi says, the failure in education almost always proceeds from an absence of interest, and this, again, is always owing to the unfitness of the teacher. And the phrenologists, knowing this, gave unqualified praise to that which the *Pestalozzians*, being destitute of all certain guide, pronounced *dangerous*.*

Mr. Owen, of New Lanark, goes even further than the article alluded to; he says, "From the earliest ages it has been the practice of the world to act on a supposition that each individual man forms his own character. This error cannot longer exist, for every day will make it more and more evident that the character of man is, without a single exception, always formed for him; that it may be, and is chiefly, formed by his predecessors: that they give him, or may give him, his ideas and habits, which are the powers that govern and direct his conduct. Man, therefore, never did, nor is it possible he ever can, form his own character." Mr. Owen has unquestionably effected most admirable results in his village of New Lanark, but his views possess neither originality nor soundness. Those who are interested in this subject will find their erroneousness exposed in vol. i. of the *Phrenological Journal*, by Mr. Combe, and in vol. ix. by Mr. Holm. The former well remarks, "Mr. Owen, like many of his predecessors, proceeds to speculate on the modifying power of circumstances without previously ascertaining the primitive attributes of the subject to be modified." Such a work as the *Constitution of Man*, or Gall's immortal *Fonctions du Cerveau*, will benefit mankind more than a dozen New Lanarks; for the former will put the people in the way of procuring these latter by their own exertions, independent of any individual.

All the errors in education which I have named, and many others, have been reprehended by Locke, Kames, Gibbon, Bentham, Pestalozzi, and many other great men, but all has been in vain: and what

* See *Phren. Journ.*, and *Anthrop. Mag.*

does this demonstrate? Why simply, as before stated, *the impotency of individual authority* and the *necessity of a science.* I therefore hope that we shall hear no longer of Pestalozzian masters and systems, and that these will give place to phrenological masters and systems. Pestalozzi himself, by the excellence of his organization, was enabled to succeed in his profession, but he could not inspire others with the same insight into the human mind as he himself possessed, even by the clearest exposition of his views, while Phrenology places a key to the mind in every one's hand. The very terms used by Pestalozzi were, in some instances, liable to mislead. Thus, a favourite term of his was "the heart." Now what is meant by this word? I never yet heard a definition of it, and without a clear understanding of the words we use we shall be liable to perpetual misapprehension. The Greeks supposed the mind to reside in the heart; hence the frequent use of the word in the New Testament. The Jews imagined that the stomach was the seat of mental manifestation, and hence we find such expressions as "bowels of compassion." But the most splendid discovery ever made has clearly proved that the mind does not reside in the stomach or in the heart, but in the brain. It may be said that those who use the word heart do not suppose that the mind really resides in that part, but simply do so from thoughtlessness or habit. But the other day, hearing some one speak of another as wanting a "bold heart," I said that the heart had nothing to do with boldness or timidity, when he answered, "Then how is it that the heart beats violently when we are frightened?" This clearly shows that he had been led away by this erroneous expression; and I have no doubt there are numbers who have some vague idea that the heart is connected with various mental feelings. Again, the word is used in very different significations. One will talk of an affectionate heart, thus attributing to that part the functions of Adhesiveness; another uses the expression "a stout heart," meaning a person with small Cautiousness and large Combativeness; while Pestalozzi, I believe, used the term to designate the moral organs of Conscientiousness, Veneration, and Benevolence. Thus we see what an endless confusion is caused by the erroneous use of one expression! I, therefore, hope that the world will join with the phrenologists in discarding an expression originally founded in ignorance, and which is calculated to continue the same. Surely every one must agree that it is a much grander and more appropriate idea that the mind is enthroned on the top, as if marking its dignified office of commander-in-chief of the whole body.

I shall conclude my sketch of the *manner* of teaching by the following excellent passage from Pestalozzi, which should be committed to memory by every teacher, though if he does not know it intuitively it may be questioned whether he is fit for his situation. "Of all tyrants it is well known that little tyrants are the most cruel; and of all little tyrants the most cruel are *school-room tyrants.* Now, in all civilized countries cruelty of every description is forbidden; even cruelty to animals is very properly punished, in some, by the law of the land, and in all stigmatized by public opinion. How, then, comes *cruelty to children* to be so generally overlooked, or rather thought a matter of course? Some, forsooth, will tell us that their own measures are wonderfully humane, that their punishments are less severe, or that they have done away with corporal punishments. But it is not to the severity of them that I object, nor would I venture to assert, in an unqualified manner, that corporal punishments are inadmissible, under any circumstances, in education. But I do object to their application, I do object to the principle that the *children are to be punished when the master or the system is to blame.* As long as this shall continue, as long as teachers will not take the trouble, or will not be found qualified, to inspire their pupils with a living *interest* in their studies, *they must not complain of the want of attention, nor even of the aversion, which some of them may manifest. Could we witness the indescribable tedium which must oppress the juvenile mind, while the weary hours are slowly passing away, one by one,* in an occupation which they can neither relish nor understand the use of—could we remember the same scenes which our own childhood has undergone—we would then be no longer surprised at the remissness of the school-boy, creeping, like a snail, unwillingly to school." This, and a great deal more that I might quote, is admirable, but it will be entirely thrown away on a certain class of teachers,

> "With eyes which scarcely serve, at most,
> To guard their master 'gainst a post."

This class will almost always be found to possess low heads, and with scarcely sufficient Causality to shed even a feeble glimmer in the intricate paths of education. Yet they have generally a very comfortable opinion of themselves, owing to a large development of Self-esteem.

We shall now turn our attention to the *matter* of education. This

is a point generally as much misunderstood as the last. The *manner* chiefly relates to the education of the propensities and sentiments, of which there are twenty-two; we now come to the treatment of the remaining organs—the intellectual—of which there are eighteen. These are the organs by which we acquire knowledge, about the value of which there can be little doubt, one should think, at the present day.

Knowledge is the most valuable acquisition within the reach of man; it is an acquisition never barren, but ever useful and pleasant. Man's superiority over the rest of the animal creation consists chiefly in his greater capacity for acquiring knowledge; and we see that, among those nations who have made little or no progress in knowledge, so far from man being lord over the brutes, the brutes are lord over man; and likewise that the happiness of these nations is as scanty as their power. We frequently hear of modern nations being stronger, and more intelligent and happy, than those which preceded them; and if we examine the cause of this we shall uniformly find that it consists in the comparative ignorance of former nations. The most celebrated of the ancient nations knew little or nothing of Astronomy, Chemistry, Natural History, Natural Philosophy, Geography, Physiology, or Anthropology, and their unhappiness and disunion was in proportion to their ignorance. Thus we may safely adopt the assertion of Socrates, the greatest philosopher of antiquity, when he says "There is only one good thing, which is knowledge, and only one evil thing, which is ignorance."

Having thus decided on the importance of knowledge, the question arises, How are we to set about its acquisition? Are we to take up the first subject which presents itself, and proceed without rule and without deliberation, as whim or fancy may suggest? No, certainly not, and for two reasons: 1st. The life of man is short, and his capacity limited; and 2nd. As it is thus impossible that he can have time or ability for acquiring a knowledge of all that the Creator has placed within his view, it is of the utmost importance that he should direct his attention to the most useful, which, at the same time, will almost always be found to be the most interesting. It is sometimes said that *a man should know everything;* but there never yet lived the man who knew everything, nor will such a man ever exist. The Creator alone knows everything; and the more a man knows the nearer he approaches his Creator. The widest range of knowledge which the most talented of the human race can attain is, compared to what remains to be known, as a drop from the ocean.

Knowledge comprehends an acquaintance with every created thing, and its relationships—with our mighty globe, with the whole burden of its people and its countries, with the stars, eighty millions in number, each of them a sun, with its retinue of planets, to which our globe is but a grain of sand on the field of immensity; and, again, with all that the microscope reveals, which shews us that in the leaves of every forest, in the flowers of every garden, and in the waters of every rivulet, there are worlds teeming with life, and numberless as are the glories of the firmament. The imagination is absolutely baffled with the mere attempt to picture to our minds the vast, the numberless tribes which every blade, nay atom, may harbour within itself, and man is again glad to seek refuge in his own insignificance.*

It now becomes evident that some method must be pursued; and accordingly, in order to facilitate its acquisition, knowledge has been divided into separate branches, each of these branches being called a science. For instance, there is the science of the heavenly bodies, called Astronomy; the science of the productions of our globe, called Natural History; and this, again, has been divided into three other sciences: the science of minerals, or Mineralogy; the science of vegetables, or Botany; and the science of animals, or Zoology.

In determining the relative value of these sciences, Phrenology is of great utility. The phrenologist knows that the higher and more anterior an organ is situated in the head, the more superior is its manifestation. Well, then, we have only to determine what organs are necessary for any pursuit to estimate its importance. For observing objects, we know that Individuality is the principal organ necessary. Mineralogy consists chiefly in the observation of inanimate, lifeless objects; thus we know the organ necessary for its cultivation. Botany, again, consists very much in the observation of inanimate objects, and thus the same organ is principally necessary here too. But then vegetables grow and reproduce, and the corolla opens and shuts; and thus the organ of Eventuality, which is situated *above* Individuality, and which takes cognizance of actions as well as objects, is slightly called into play. Hence Botany is a higher study than Mineralogy; but Zoology is highest of all, for here, not only is Individuality required, as in the other two, but Eventuality, too, is called into full activity; and also an organ yet higher than this, which has yet received no name: a short account of it will be found in the last

* The reader will find this subject beautifully dilated on in Chalmers's *Lectures on Astronomy.*

number of *The Analyst*, p. 345. Without Phrenology the same conclusion might be arrived at, *but it could not be demonstrated*, and thus it would always be open to dispute. A vegetable, we may say, is higher in the scale of created beings than a stone: the vegetable grows and produces other beings similar to itself, neither of which operations is the stone capable of. Thus Botany is a more interesting study than Mineralogy; but Zoology is yet more interesting, for animals not only grow and reproduce, but they also move, and think, and act in concert, some roving through the forests, others hunting in packs; some sailing through the trackless air, and others in safety ploughing the pathless ocean.

But Zoology being so very extensive a subject that any one department might engage a man during his whole life, it becomes evident that we must restrict our attention still more. Having fixed on Zoology as the most interesting subject within our grasp, what part of animals shall we investigate? Shall we study the bones, constituting the science of Osteology? or the heart, called the science of Cardiology? or the general structure, forming the science of Anatomy? All these are interesting and useful; and thus, at the very outset, we are situated like Bees in a garden of sweet flowers, each holding out greater attractions to the industrious little honey-collectors than those around.

There is one consideration, however, which will enable us to make a profitable choice. The thought has probably already occurred, that if knowledge is such a very interesting and useful thing, what knowledge can be more interesting and useful than that concerning the instrument by which we obtain knowledge? What is this instrument? It is the mind, and the science of the mind is called Phrenology, the most interesting and important subject that can engage the attention of man.

We thus see how the importance of a subject may be traced step by step; and I have given this specimen to put educators in the way of estimating the utility of the various subjects they may wish to bring under the attention of their pupils. This is a process not at all understood. Some say, as I have before stated, that *every thing* should be learnt, but those who speak thus must either entertain a very exaggerated idea of the capacity of man, or else a very contracted idea of the extent of knowledge. When the propriety of teaching such and such a subject is called in question, nothing is commoner than to hear that the *whole circle* should be taken in. What does this expression mean? Is all knowledge intended by the "whole cir-

cle?" or is it intended to convey an intimation that an outline or general idea of every subject should be possessed? If the former is intended, the idea is absurd; if the latter, it is very good, but can afford no plea for putting one subject of comparative insignificance in a prominent place, to the exclusion of one of importance.

Man is ever apt to branch into extremes. Formerly it was the plan to teach only *one* subject, and those who came after, seeing the absurdity of this, declaimed on the necessity of knowing every thing. But if asked for a definition of this every thing, the supporters of this scheme would probably be very much puzzled. No phrenologist would hold such a doctrine. I shall quote some excellent remarks on this subject by an able phrenologist. "As man cannot cultivate all his powers equally, it is surely better that he should cultivate those which he can turn to some account, than, by unavailing efforts, endeavour to excel in something for which he was never designed by nature. How ridiculous it would be for an individual paralytic in the lower limbs to choose the profession of dancing! But would it not be equally absurd for an individual destitute of musical talent to follow Music as a profession? or an individual who could not discriminate colours, to wed himself to the profession of Painting? When talent is naturally weak, it may, by cultivation, be rendered stronger, but no education can compensate for natural deficiencies; and hence, when any power of the mind is very weak, the cultivation of the power will never lead to any satisfactory result, and time will be lost in the effort, which might have been beneficially employed in training some of the other powers more susceptible of improvement. As no human being can excel in every thing, why should not every one confine his attention to that department of art or science most congenial to his nature? But how are we to discover the talents or genius of the individual? In two ways: 1st. In observing the natural bias or inclination of the individual; and 2nd. By following the light which Phrenology throws so broadly and steadily upon the subject." This is all sound and judicious. In another part of the *Philosophy of Phrenology* we find the following passage:—"It must be admitted that the majority of mankind are possessed of *partial* talent. A man who can excel equally in every department of art and science does not exist. His existence is a physical impossibility. But, even admitting the possibility of the case, a question arises whether it would be more *prudent* to cultivate one or a few of these powers to the degree of which they are susceptible, or to attempt to cultivate all the powers, and attain only a mediocrity in each. Had Paganini, for example,

attempted to excel in Mathematics, Metaphysics, Poetry, Painting, Languages, &c., as well as in Music, would he have stood as pre-eminent above his compeers? He probably would not have been known beyond his native city of Genoa. The powers of man are limited, and it is better that he should do little, and *that* well, than that he should attempt to do much, and do nothing successfully. Now is it a matter of little moment that Phrenology should be able to point out what powers of the mind are capable of the most successful cultivation in any individual? Is it nothing that whole years of unavailing efforts should be saved? that the child, from his earliest infancy, should be directed into the path in which his own happiness is to be found, and in which he can most successfully promote the happiness of others? Nobody will doubt that, if Phrenology can lead to this end, it is capable of effecting much good; and every one acquainted with Phrenology also knows that the talents of any individual can easily be recognised, and their relative powers, consequently, easily calculated."

Having thus clearly established that the kind of knowledge placed before each should be in accordance with his natural talents, it only remains to be considered by the teacher what subject or subjects, out of the numberless departments which present themselves, should be studied by his pupils. Thus, if a pupil has large Individuality, Eventuality, and Causality, he will have a talent for the natural sciences, and the teacher, knowing this, has only to make the best choice. Phrenology we have already found to be the most important branch of knowledge that can engage human attention: "The proper study of mankind is man." Next in importance we may mention Anatomy, some knowledge of which is as indispensable as Phrenology to the preservation of health. To use the words of Mr. Combe, "It may be imagined that rules for the preservation of health may be taught without Anatomy being studied; but all such instruction is empirical. The rule resides rather in the memory than in the understanding; and the possessor has no power of modifying his conduct and adapting it judiciously to new circumstances. When a good description of the respiratory organs has been given to a young woman she understands much better, feels more deeply, and remembers much longer and more clearly, the dangerous consequences of exposing the throat and breast to a stream of cold air or to a sudden change of temperature, than if she has only *heard* or *read precepts* to avoid these and similar errors." This seems very obvious, and yet how seldom is it acted on! The mother or teacher is too apt to rely on mere precept, and

their hope, being thus based on the sand, is as unstable as the house of the "foolish man." Pestalozzi well remarks, "It will be indispensable to convince many a fond mother that what was well meant is not always well done, and strongly to impress upon her mind the fact that, by a mode of proceeding flowing from the most benevolent motives, but which would not have stood the test of matured judgment, she may entail on her children all that misery against which it was her only wish to protect them."

If we continue our examination into the more important departments of knowledge, we shall find that, next to Phrenology and Anatomy, which make us acquainted with the mental and bodily constitution of man, Physiology, Medicine, Zoology, Geography, Geology, Chemistry, and Astronomy, hold out seductions tempting, nay irresistible, to the pupil. But instead of entering on these noble subjects of investigation, the teacher, with a strange perversity and blindness, persists in directing, or misdirecting, his chief energies to the development of the organ of Language, which is at the base of the brain, and the lowest of all the intellectual faculties. Disregarding the subordinate place the Creator has thus assigned it, man persists in raising it into the highest. Verily he has his reward!

Language does not constitute knowledge: it is mere learning. A person may know the various names a Horse has received in various languages, and yet have no knowledge of the Horse; and, again, he may not know any of these names, yet if he possesses an acquaintance with the natural history, the structure, the qualities, and the uses of the animal, then he will have acquired some very interesting knowledge. Again, Arithmetic is not knowledge; a person may know that 2 and 2 make 4, and even be a Bidder in Arithmetic, and yet he may not have acquired any knowledge. But if, by the learning he has acquired, he calculates that our globe is nearly eight thousand feet in diameter, then he has acquired an item of knowledge. Thus we see that learning and knowledge are very distinct, and that learning is barren and useless in itself, and only useful in so far as it enables us to acquire knowledge. Hence we perceive the truth of the maxim that a very learned man may be a very ignorant man.

But, overlooking this distinction, teachers continue to ply their pupils with learning, as if it were knowledge itself, instead of, as is really the case, only a ladder to knowledge, and often an useless one, too; for the latter, in nine cases out of ten, can be arrived at without the former. Thus, Greek and Latin are totally useless as a means of acquiring knowledge, and for two reasons: 1st. The Greeks and Ro-

mans had very little knowledge to communicate; and 2nd. That little has already been translated into the British language. Little or nothing was known of the mind, of the body, of the stars, of the healing art, of Natural History, of Astronomy, of Geography, of Geology, of Chemistry, of Government, till the appearance of Gall, Hahnemann, Linnæus, Galileo, Columbus, Lyell, Davy, Bentham—all moderns; and yet teachers, with a perversity unparalleled, perhaps, in the annals of mankind, continue to toil in the same barren path, without a single rational reason to warrant so strange a procedure! I have actually known a teacher put a Greek grammar into the hands of a pupil, in play-hours, who was reading a work on Natural History; and when questioned why he did so, gravely answered "The proper study of mankind is man!" *Very learned, but not the less ignorant for that!* And thus it is that mere language has acquired a repute above real solid acquirements in knowledge. Phrenology will, however, dissipate this, like most other errors: this science shows us why great linguists are, as Dr. Macnish remarks, generally great blockheads. An American phrenologist says, "When the doctrines of Phrenology come to be generally understood, the admiration excited by the possession of a great number of dead and foreign languages will be much diminished. It will then be considered merely as evidence of a large organ of Language, and as no evidence of superior general talents." It is owing to the disproportionate attention that is paid to the education of this organ that *style* is generally placed above *matter;* and I have actually heard it maintained that if the style was good the matter or ideas cannot be bad! It must appear obvious, however, I should think, that the worst ideas may be conveyed in the best language, and that the worst language may be employed to convey the best ideas. It is said that the Greek in which some parts of the New Testament are written is almost barbarous, yet every one knows what the ideas are; and, again, the most poisonous and dangerous ideas have constantly been couched in the most sublime and eloquent language. Bentham seems to have been aware of the propensity of the shallow-minded (phrenologically speaking, those with small Causality) to be taken in by style; for he says he has written one of his treaties to "teach the reader to distinguish between showy language and sound sense." And in the course of this treatise, speaking of Blacksone's *Commentaries*, he remarks, "Correct, elegant, unembarrassed, ornamented, the *style* is such as could scarce fail to recommend a work still more vicious, in point of *matter*, to the multitude of readers."

One great error in which parents wreck many a fond hope unconsciously, is their idea that they have only to procure teachers who know the subject that is to be taught; and so rooted is this idea that nothing can exterminate it. It hangs like a mill-stone about their necks, and renders futile all their exertions. It is in vain that it is argued, nay demonstrated, that all the learning and knowledge in the world is useless, or worse than useless, if the teacher has not the tact for teaching, which is only possessed by those with a particular organization, and which, as Mr. Wood, of Edinburgh, truly remarks, no experience can give. It is in vain, also, that it is urged that Pestalozzi himself declares some of his most successful teachers to have been those who knew nothing of the subject they intended to teach, and that Jacatot says the same thing, and that common sense says the same thing; the original idea clings like a leech, and the consequences we all know.

There is a village schoolmaster in my neighbourhood who knows as much or more than he will ever have occasion to communicate to his pupils, and yet it all lies useless in his own brain, because he has not the tact to communicate it. He has not, during many years, got beyond teaching his pupils to read! I have heard some of them read at various times, and they did not read as if they understood the subject; I accordingly questioned them. One boy came to the passage in the New Testament, "wearing a crown of thorns." I asked him what "wearing" meant: he did not know. A girl came to the expression "dissolved:" she did not understand the meaning. I asked her what a lump of sugar became when put into tea. Her eyes, before expressionless, now brightened up; the meaning, which was before dark, now dawned on her. In this way I cleared up the various unintelligible words; and the business thus became as delightful as it must before have been irksome. Reading and writing are not knowledge, but mere learning, and they only exercise the organ of Form; but if knowledge can be mingled with the learning, it is like causing the desert to blossom as the Rose. A valuable precept of Locke is entirely disregarded. He remarks, "But, under whose care soever a child is put to be taught, this is certain, *it should be one who thinks Latin and languages the least part of education.*" And after this he proceeds to shew how Latin or other languages may be taught, as he has known from personal experience, by one who is unacquainted with them. Let a teacher have the *manner*, and the matter cannot fail to follow; but parents, in their anxiety for the latter, lose all.

With regard to Logic, it is usually attempted to be imparted in even a worse manner than Greek and Latin. It is often taught by those who have small "Causality" and "Insight into Human Nature," and the attempt is, of course, futile. I would recommend all those who have been engaged in this department to peruse the *Testimonials* published by Combe, in which the various eminent writers concur that no sound system of Logic can be taught without Phrenology. One writer says, "Convinced as I have been that Phrenology is the true philosophy of mind, I cannot but regard it, not only as conducive to the successful teaching of a Logic class, *but as the only foundation on which sound Logic can be reared.*" How many there are, alas! who will be obliged to express the same sentiments as another writer—"An old student myself in the Logic class, I can never look back *but with regret on the barren path* I then found myself obliged to tread."

Nor is it possible to teach language as it should be taught without an intimate acquaintance with Phrenology; and yet how many there are who undertake this without even knowing the names or the number of the primitive faculties of the human mind! It is ignorance like this, conjoined with an unfavourable development, that prompts to their insane mode of proceeding, a mode equally unsound whether we regard the manner or the matter. It would hardly be believed, but I can vouch for the fact, that one-half of the time devoted to language is not unfrequently expended on—*grammar!* I shall cite the opinion of Lord Kames on this point. "In teaching a language it is the universal rule to begin with grammar, and to do everything by rule. I affirm this to be a most preposterous method. *Grammar is contrived for men, not for children.* Its natural place is between language and logic; it ought to close the lectures on the former, and to be the first lectures on the latter. *It is a gross deception that a language cannot be taught without rules.* A boy who is forced into grammar rules makes a shift to apply them [from rather extensive observation, I should rather doubt whether even this was the case]; but he applies them by rote, like a Parrot. Boys, for the knowledge they acquire of a language, are not indebted to dry rules, but to practice and observation. To this day I never think without shuddering of Despauter's grammar, which was my daily persecution during the most important period of life. Curiosity, when I was further advanced in years, prompted me to look at a book that had given me so much trouble. At this time I understood the rules per-

fectly, and was astonished that formerly they had been to us *words without meaning*, which I had been taught to apply mechanically, without knowing how or why."

This passage is admirably true, and had it been adopted by teachers as such, the pupil might then have had a chance of that which, under the present system, is next to impossible—learning a foreign language within a reasonable time, and that, too, with pleasure to teacher and pupil. Locke, Gibbon, and Pestalozzi, have expressed the same idea in language equally forcible; and yet teachers, like Horses in a mill, cannot quit their old round. Truly they are a stiff-necked generation!

From the hasty survey which we have now taken of some of the leading essentials in a sound method of education, two prominent circumstances cannot fail to impress our minds: 1st. That a particular organization is indispensable to a successful teacher; and 2nd. That all education that is not based on Phrenology must be empirical and unsound. Both these facts seem to me self-evident; but, for the sake of those with whom "authority serves for reason," as Locke expresses it, or, phrenologically speaking, whose Veneration is unguided by Causality, I shall quote the words of various writers. The master of the English department of the High School of Glasgow thus expresses himself:—"As education, properly considered, aims at the proper development and regulation of man's nature; as it is, therefore, *absolutely essential to a teacher's success* that he should have a *guide* to the knowledge of that nature; and as Phrenology appears to me not only the plainest but the most satisfactory guide yet discovered; it is my decided opinion that he who teaches and *trains* upon phrenological principles will experience a constantly increasing attachment to his profession, will invariably secure the affectionate esteem of his pupils, and will, as a necessary consequence, succeed in giving them a thorough EDUCATION, moral, intellectual, and physical. I write this not in a theorizing spirit, but *from several years experience.* * * In History the use of Phrenology is truly valuable. In fact, till I knew something of this beautiful system of mental philosophy, *I never taught History properly, or, I may add, anything else.*" This testimonial is truly valuable, and completely conclusive, coming as it does from a teacher of long standing. He had a fit organization for teaching, and only wanted the guide which was furnished by Phrenology. But to others, as I have before mentioned, Phrenology would be of no service. The telescope is necessary to enable the astronomer to prosecute his studies, but the telescope would be of no service to the blind

man; and in the same relation Phrenology stands to those whose organization is unfit for the office of teacher.

Phrenology will, doubtless, soon be considered by society at large as indispensable to the teacher as it is at present by the thinking few. The science has hitherto, however, been regarded too much in the light of a means of predicting character; that is, the inferior branch called Organology has been confounded with the science of Phrenology properly so called. This has been owing to the general preponderance of the perceptive or lower intellectual faculties over the reflective or higher intellectual faculties. The former should be left to professed organologists, as Deville; while those who wish to soar into the higher departments should follow in the steps of the phrenologists, as Gall, Combe, and Vimont.

Mr. Robert Chambers remarks, "I have reason to know that, with or without the Organology, the science of Phrenology is making rapid progress amongst the more thinking portion of the middle and lower ranks. Its progress would, in my opinion, have been much greater if its pretensions as a means of discovering character from external signs (Organology) had not been ignorantly confounded with those of the false sciences of the middle ages. Were the metaphysics presented alone, this obstacle would be, in a great measure, overcome, and multitudes who have hitherto regarded the science as only a new kind of divination or palmistry, would be astonished to view a system calculated to throw the united labours of Aristotle, Locke, Reid, and Stewart, into the shade; an almost exact reflection of human nature, a code of sublime morality, a means of accelerating to an unprecedented degree the social progress of our race." Alluding to the different candidates for the logic chair, the same author remarks, with equal truth and sound sense, "Indeed, were it not that many of the most enlightened men are still ignorant of the merits of the new system, the filling of the present vacancy with one who persists in describing the mind as consisting of memory, judgment, and imagination, would appear to me as a solecism not less great than would the appointment to the chair of Chemistry of one who continued to describe fire, earth, water, and air, as the elements of matter."

Towards dispelling the gross ignorance which prevails on the subject of the mind, no work will operate more effectually than Gall's unequalled *Fonctions du Cerveau*, which Dr. Elliotson pronounces to be worth all the other phrenological works put together. Next to this may be ranked Combe's *System of Phrenology*, of which Dr. Macnish thus speaks:—"Great light has been thrown on this

science by Mr. Combe. His *System of Phrenology* is a beautiful exposition of the phenomena of mind, and constitutes, in my humble opinion, by far the best system of mental philosophy in the English language." Another work which I may mention is the *Constitution of Man*, a work which, next to the New Testament, I would recommend to every one's perusal. Dr. Macnish continues thus:— "His volume on the *Constitution of Man* is a performance of an equally high order of intellect, and may be justly considered one of the most remarkable productions of the present day. Few works have met with such a circulation; and when we consider its extraordinary merits, this fact is no way wonderful." The *Anthropological Magazine* is a periodical that should be possessed by every one in the island.

If the time or opportunities of any one, but especially of any one connected with teaching, are limited, the works which might be studied with most advantage are Macnish's *Introduction to Phrenology*, and Combe's *Constitution of Man*. These two works, to a reflecting mind, will furnish all that is necessary to frame a complete and successful system of education. And if teachers could be persuaded to take these for their guide, they would be astonished at the entire and radical change which would take place in their whole manner of thinking, and the different light in which they would view the actions of their pupils. Dr. Elliotson has, in a few words, summed up some of the advantages which Phrenology will confer on the human race. "None but those," says he, "who are totally ignorant of Phrenology regard it as a means of merely discovering natural powers and dispositions by external signs. Those who have studied it know, indeed, that the natural powers and dispositions are, *cæteris paribus*, in conformity with the size of the various parts of the brain; but they know likewise that Phrenology unfolds the only satisfactory account of the mind, human and brute; that it contributes to establish the surest foundation for legislation, education, and morals, and presents a large department of nature in the noblest, grandest, and the only satisfactory point of view; and that those who reject or neglect Phrenology are lamentably ignorant of much which they fancy they know, and deprive themselves not only of much intellectual delight, but of much practical utility, and, *compared with phrenologists, remain as men of some centuries past.*"

Man has all the capacities for reaching the topmost pinnacles of knowledge, and fathoming its inmost depths; consequently, he possesses the fountains of happiness and enjoyment: and yet he remains ignorant, and, therefore, unhappy. Why does he not put

forth his faculties to their full extent, and treasure up the golden boards of knowledge which have been placed within his reach by his Creator? Because he has not clear ideas of his own mental constitution; in other words, because he is ignorant of Phrenology. Man will never attain that full enjoyment of which he is capable till he acquires complete and correct ideas of his own constitution; and till then he may rest assured he will remain in his present wretched state.

How, then, should we hail any science that promises to elevate mankind from their present condition; a science which will bring the blessings of civilization not only to Britain but to the whole world; which, with powers scarcely less miraculous than those of Moses' rod, will cause the water to gush forth from the parched understandings of men, and unlock the inmost springs of the mind; which will diffuse light where darkness previously prevailed, and cause kindly feeling to bloom like an evergreen! The sons of Britain answer with one accord, and the whole world echoes the answer, "We should gladly sacrifice everything we possess to gain so noble, so incomparable a blessing; and no obstacle should retard our eager footsteps while pressing forward to secure so inestimable a boon." Phrenology is such a science! It is a sun—human nature the world it illuminates; which nature, wherever existing, and under whatever aspects seen, must feel the benign and quickening influence of its beams.

S. D. W.

CORRESPONDENCE.

To the Editors of "The Analyst."

Gentlemen,

I place at your service the following geological observations, in the hope that they may prove interesting to some of your readers.

The form of a coast, lake, valley, or mountain can often be traced to the former prevalence of earthquakes and volcanoes in regions which have long remained undisturbed. To these convulsions the

fertility and sterility of the soil, land above sea, and various peculiarities may be distinctly referred. On the other hand, we observe present changes slowly taking place in rivers, lakes, and shores. Another example: we find in certain localities a substratum of coals, the remains of vegetables, and as Mr. Lyell justly observes, "the commercial prosperity and numerical strength of a nation may be mainly dependent on the local distribution of fuel determined by that ancient state of things." On taking a general view of the country on the Kentish side of the river Thames, we observe a rich variety of hill and dale, cultivated in a manner calculated to excite the most powerful emotions of the mind in admiring the beauties of Nature. No man can behold the matchless scenery of Kent without feelings of wonder and admiration; the fertile plain, the barren hill, the sloping plantation of fruit trees: and in spots where Nature parches and withers, we see the ingenuity of man adorns the place with the Raspberry and the Strawberry. The valleys run, there or thereabouts, from east to west —a fact which supports the theory of the earth revolving on its poles; as the tides would in consequence have a natural tendency to run east and west. Some writers of distinguished talent have gone so far as to contend that the origin of the greater number of existing valleys was simply due to the agency of one cause, and that it was consummated in a brief period of time. But I believe the sinuosity of deep valleys is one among many proofs that they have been shaped out progressively, and not by the simultaneous action of one or many causes. In regard to the transporting power of water, we are often surprised at the facility wherewith streams of a small size, and which descend a high declivity, bear along coarse sand and gravel.

It is impossible to deny that the waters of the sea have formerly and for a long time covered those masses of matter which now constitute our highest hills; and, further, that these waters for a long time did not support any living bodies, that is in reference to changes which took place in the inorganic rocks. It is also evident that the basin or reservoir containing the sea has undergone some change at least, either in extent or in situation, or both; such is the result of the very first search and of the most superficial examination.

On penetrating the different parts of this coast, the strata vary considerably in depth, the plastic clay being deepest in the valleys and immediately as the hill ascends. On removing the diluvial crust or debris we come to a layer of sand, which runs from two to eight feet from the surface. This formation contains fresh-water

shells, the *Venus, Cytherea, Helices,* and *Cardium,* and the remains of existing animals: it is termed the new Pliocene formation or period. Although new in comparison with the others, it is yet of high antiquity in regard to man. The next structure is a bed of plastic clay, varying from one foot to forty feet in thickness. This lies upon another bed of sand, containing the remains of animals, some of which are extinct. These strata clearly demonstrate a deposit after each action of the tide. There is a process going on, or was in operation fourteen years ago, on the levels connected with the river Trent, in Lincolnshire, termed warping: it was accomplished by means of two sluices which conveyed the tide to the upper part of the level. Flood-gates being closed until low water, gave time for a deposit; upon raising up these gates clear water passed off, leaving a coat of earth on the surface of the land. The owners of the property continued this operation from three to six years, according to effects, rendering land which was nearly valueless worth from £55. to £75. per acre, consequently capable of the higher culture. This example tends to illustrate the regular deposits which are observable in all the aqueous formations. I have not only found in this bed portions of the Mammoth or extinct Elephant, the Asiatic Elephant, Rhinoceros, Lion or Tiger, Hyena, Horse, Buffalo or Ox, Elk, Deer, and Boar or *Sus scrofa,* but numerous shells, viz., *Unio, Helix, Melania, Cytherea, Cardium, Infundibulum, Echinulatum, Micula, Oliva, Venus,* &c. This is termed the old Pliocene formation. Dr. Buckland, in remarking on this period in the *Bridgewater Treatise,* vol. i., p. 95, says:—"It appears that at this epoch the whole surface of Europe was densely peopled by various orders of mammalia; that the numbers of the *Herbivora* were maintained in due proportion by the controlling influence of the *Carnivora,* and that the individuals of every species were constructed in a manner fitting each to its own enjoyment of the pleasures of existence, and placing it in due and useful relations to the animal and vegetable kingdoms by which it was surrounded. Every comparative anatomist is familiar with the beautiful examples, mechanical contrivance, and compensations which adapt each existing species of *Herbivora* and *Carnivora* to their own peculiar place and state of life. Such contrivances began not with living species. The geologist demonstrates their prior existence in the extinct forms of the same genera which he discovers beneath the surface of the earth, and he claims for the author of these fossil forms, under which the first types of such mechanism were embodied, the same high attributes of wisdom and goodness,

the demonstration of which exalts and sanctifies the labours of science in her investigations of the organizations of the living world."

Under the old Pliocene formation we come immediately to the chalk, which in this neighbourhood has not been penetrated. The fossil remains which I have been enabled to collect, consist of the following, viz.: *Snocerami*, several species; *Echini*, ditto; *Plagiostoma, Spinosa, Serpula, Dianchora, Pecten, Terebratula, Ventriculite, Pentagonaster* (one of which I possess, the five sides being complete), with numerous ossiculi, and fishes and reptiles teeth: the fishes teeth belong to the Squalus tribe. In some parts of the plastic clay is occasionally found a thin bed of chalk, deposited between the new and old pliocene formations. Immediately on the bank of the Thames there is a dark-coloured bed of plastic clay, lying over a stratum of six feet thick, containing an immense quantity of vegetable matter, principally the remains of the Yew tree, sufficient to answer the purpose of fuel, if treated after the manner of making peat. The greater number of shells, both in the fresh-water and marine formations of this tertiary series, are so nearly allied to the present genera that we may conclude the animals by which they were formed to have discharged similar functions in the economy of Nature, and to have been endowed with the same capacities of enjoyment as the cognate molluscs of living species.

Those geologists who are not averse to presume that the course of Nature has been uniform from the earliest ages, and that causes now in action have produced the former changes of the earth's surface, will consult the ancient strata for instruction in regard to the reproductive effects of tides and currents. It will be enough for them to perceive that great effects now result from the operation of these agents in the inaccessible depths of lakes and seas; and they will then search the ancient lacustrine and marine strata for proofs of analogous effects in times past. Thus we have a collection of facts, a series of epochs anterior to the present time, and of which the successive steps may be ascertained with perfect certainty, although the periods which intervened cannot be determined with any degree of precision. These epochs form so many fixed points, answering as rules for directing our inquiries respecting this ancient chronology of the earth.

J. GRANTHAM.

Crayford, Kent.

To the Editors of "The Analyst."

Gentlemen,

Being once more in my own quiet room, after a hurried and harassing visit to London, I take the earliest opportunity of writing to you, for the purpose of mentioning certain things and circumstances which afforded to me both satisfaction and improvement.

I left Hull, by the Water Witch steamer, for London, July 8th. There were many passengers, some, of course, very commonplace, and others highly-interesting companions. Among the latter *species* may be mentioned two Anglo-African merchants. One of them had resided some years in a colony near the river Gambia, and the other at Fernando river. Our conversation consisted of statements on their part, and questions on mine, on the social, moral, intellectual, and commercial condition of the African aborigines. In connection with the commercial information they gave me, I think the following facts somewhat important. Firstly, that there is a great quantity of gold, in various sized pieces, along the whole line of coast, and which rich metal is only mechanically mixed with the alluvial soil; so that it requires little capital or trouble to collect the ore together. Secondly, that, from this and other sources, a fine prospect is afforded for commercial speculation, particularly as English manufactures are preferred by the natives. Thirdly, that when European settlers are temperate, and not addicted to sensual excesses of any kind, they may enjoy very good health. One of the gentlemen was a man of colour, and the other an Englishman, but both looked extremely well, and very intelligent. They particularly wished for a list of good elementary works on Science, Physiology, &c.; they were also much pleased with Phrenology, and were eager to know something about it. By the way, I found almost every body desirous of obtaining some phrenological information. Truth may be slow in its progress, but nothing can ultimately impede it. Whatever the obstacles or the prejudices which have hitherto retarded the philosophy of Gall and Spurzheim, they will now be crumbled to pieces, and be dissipated like chaff before the wind; because the common sense part of the community begin to recognize the importance of Phrenology for education, for criminal legislation, and for the treatment of the insane.

When in London I called at most of the institutions, and found them in a flourishing state; I also saw many private collections of

Natural History. It would be occupying too much of your space to make particular mention of them, but I cannot resist describing a few of the things I saw. In a shop in the Strand, nearly opposite Chandos-street, there are a number of specimens of copal, with insects; Moths, Spiders, and Ants, are enclosed within this transparent yellow substance, forming a beautiful contrast to the tombs which usually receive the bodies of all things which have lived and moved. Instead of the gloom which generally surrounds the last habitations of animated beings, here was brightness; and instead of being loathsome to look upon, they were something to admire and covet. There was one thing that particularly struck me, namely, that the Moths, Spiders, and Ants, although "quietly inurned" in their present magnificent sepulchres for centuries, retained their forms and *palpableness*, and seem as if they were but the other day doomed to be incarcerated in their present resinous receptacles. How insignificant and bungling seem the vain efforts of man to embalm and preserve the corpse of some departed friend, by saturating it in bitumen, and by folding it in numerous filaments saturated with essential oils, as compared to this manner of preserving animal bodies in a transparent, imperishable, and, when polished, elegant substance! O Nature, thou art profound and perfect, even in what may appear fanciful in thy works!

Whilst detained in the Strand for some models I had ordered, I took the opportunity of visiting the Adelaide Gallery. It was about a quarter before two o'clock, the time when the magnetic and electro-magnetic phenomena are exhibited. A very talented gentleman, whose name I do not know, gave a short lecture on these interesting portions of Natural Philosophy. He showed us the decomposition of water by the electro-magnetic agency, and its recomposition by combustion; and also the immense power imparted to the magnet, to sustain very great weights, whilst a galvanic circle was kept circulating round the copper coils which surrounded it; and, lastly, the brilliant experiment of inducing a succession of sparks from a large magnet, proving to the senses that there is an identity between electricity, magnetism, and galvanism. But what is particularly worth your attention is this fact, that I and many other persons took a shock from the large magnet, and remarked that the sensation was most powerful at the elbow joints, where it seemed to terminate. Now when a shock is received from an electrifying machine, whether from a cylinder or plate, it passes through the whole body instantaneously, and the mind is conscious of the phenomena; but this is not the case with the shock from the elec-

tro-magnetic apparatus. It then occurred to me that this phenomenon (the shock from the magnet not being felt beyond the elbow joints) would seem to warrant the supposition that the electric matter differed in degree and intensity according to the media through which it is transmitted.

I am, Gentlemen,
Your obedient servant,
J. L. Levison.

PROCEEDINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY.

The ordinary meeting was held on Monday evening, Mr. Stephens, President, in the chair. Mr. Bowerbank exhibited some specimens of cork, which had been greatly injured by a species of *Dermestes*. The vessel in which the cork was brought over to the docks had previously contained a cargo of hoofs, horns, and bones, from which the insects were produced. A great deal of injury had also been done to the mast of the ship, which would have to be replaced; and it was even feared that the vessel itself was destroyed. The insects had already committed very extensive ravages in the localities of Saffron Hill and Whitechapel, where they attacked the posts in all directions, and were also very common in Wapping. Mr. B. suggested, for their destruction, the essential oil of almonds, the vapour of which would probably be effectual.—Mr. Bainbridge exhibited a small species of Moth, which had been very injurious to Apple trees in the neighbourhood of Lambeth; in many cases the leaves were destroyed altogether. The cocoons are formed on the leaves, which soon become covered with webs so strong that, in many cases, the young leaves cannot burst through them; but the larger leaves of Apple trees escape, and Pears are but rarely attacked.—Mr. Westwood detailed an entomological visit lately made to Paris; and, amongst other subjects, he noticed a disease called muscadine, with which Silk-worms have been very extensively attacked in France. The malady, like a parasite, gradually envelopes the whole body in a white fungus, and destroys the worm; the mischief being produced by the explosion of a fungus, which is taken in by the spiracles or pores of the skin, as has been proved by M. Audouin, who has inocu-

lated several worms and beetles with it. There was also a specimen of the *Scolytus pygmæus*, an insect which attacks the Oak, and which has latterly proved so destructive that 80,000 trees in the Bois de Vincennes have been cut down, in consequence of its attacks. Mr. Westwood, in conclusion, made some remarks on the progress of Entomology in France, which he stated to be in advance of this country, there being more working cultivators there, and the collection at the Jardin des Plantes being superior to that at the British Museum. M. Audouin had just completed a course of fifty lectures on Entomology.

WARWICKSHIRE NATURAL HISTORY AND ARCHÆOLOGICAL SOCIETY.

The council of this Society read their Annual Report to the members on the 23rd of May, 1837, at their first anniversary meeting. This Report is arranged under three general heads, preceded by some necessary preliminary observations. It was considered by the council to be highly important to make the quarterly meetings interesting to the members at large; and, during the past year, they have been fortunate enough to obtain the assistance, on those occasions, of Professor Buckland, of Dr. Lloyd, and of Mr. M. Bloxam, by each of whom a very interesting address has been delivered to a large auditory, with the effect of increasing the number of the friends of the Society. At one of the quarterly meetings, Mr. Sharpe read a paper on a curious archæological subject; but the council regret not having yet been favoured with communications, so much desired by them and so easily furnished by all observant naturalists, relating to the different branches of Natural History.

Geology and Mineralogy.—Considering that the Society's first year has but just concluded, the collection in Geology and Mineralogy has attained a greater extent than could have been anticipated in so short a period; and it is a subject on which the council congratulates the Society, more especially as the far greater proportion consists of contributions from the cabinets of members and others interested in its welfare; the sole purchase which has been made being a series of mountain rocks, all of them illustrative of some part of the Geology of the British Islands, collected by the Rev. Dr. Rowley, late Master of University College, Oxford. The cost of this interesting and well-selected collection was only ten pounds.

Many persons, possessing private collections, are oftentimes prevented from contributing to public museums from not being aware of what things may be desired; and others, not being in the habit of collecting for themselves, and feeling but very little interest in any particular branch of Natural History, having nevertheless many oppor-

tunities, during summer excursions, of acquiring various natural objects, would gladly do so had they but a few directions as to the kind required. To obviate these obstacles and with a view of enabling all who are disposed to add their mite to this department, as well as of offering an incitement to indulge in an agreeable amusement which may grow into a rational pursuit, the council takes a cursory review of the present state of the collection, and in so doing points out those parts of it in which deficiencies are most numerous, at the same time remarking that no part is by any means complete. In the rocks more ancient than the coal formation, and in that division of them called primary, viz., from the Mica Schist to the Clay Slate inclusive, the collection is defective; and visiters to the romantic mountain scenery of North Wales, or the Cumberland and Westmoreland lakes, may have ample opportunities of obtaining examples; but of the series succeeding to the Clay Slate, viz., the Transition, Upper Grauwacke, or, as it is now called, the *Silurian* system, the Society possesses many rare and characteristic animal remains, from the neighbourhood of Ludlow and from the well-known Dudley Limestone. Of the Carboniferous system, they have numerous and choice specimens, particularly of the vegetables belonging to the coal formation itself; but in the animal remains of the Mountain Limestone, which is found in Derbyshire and several other northern counties, in the neighbourhood of Bristol, and in South Wales, the collection is deficient; and almost any fossils, particularly Encrinites, should, if possible, be obtained. It is well known that organic remains in the New Red Sandstone have but recently been detected in England, and at present none have been found in a good state of preservation, so that every thing should be actively searched out and carefully collected. The Magnesian Limestone, which belongs to this series and is extensively distributed in some of the northern counties, affords many and curious remains; of these, at present they have not one. No part of the collection is so rich as that of the Lias, though it may reasonably be expected that the numerous Limestone quarries in this county will continue to yield new and valuable additions. At present, scarcely any vegetable remains of the Lias of Warwickshire have been detected; and it is greatly to be desired that the attention of those members residing near the quarries should be directed to that part of the subject. Any fossil specimens of the remaining secondary rocks, from the inferior Oolite to the Chalk inclusive, are desired. A similar remark is applicable to the tertiary strata; since, with the exception of a few crag fossils from Norfolk, the collection contains no British organic remains of these strata. A most valuable contribution of tertiary fossils, from Sicily, has been presented by the Marquis of Northampton. The London Clay in Kent, Sussex, and Hampshire swarms with fossils which may be easily obtained. The collection of simple minerals is at present very limited in extent. Of these, there is one which is entirely new. It is a beautifully crystallized Salt of Alumina, and, according to Dr.

Apjohn's analysis, appears to be a sulphate of that earth with Manganese. It was brought from the neighbourhood of the Bushman river, in South Africa. In concluding this part of the Report, the council strongly recommends those members who may in future present rock or fossil specimens (and the recommendation is equally applicable to all branches of Natural History), to pay particular attention to attach the name of the place from whence each specimen may have been derived, to the specimen itself or to the paper envelope. So important is it to attend to this, that it frequently happens that, from inattention to this circumstance, specimens are worse than worthless, as it leads to error and confusion in attempting to arrange them.

Zoology.—The specimens in Zoology, although daily increasing, are not numerous. This department contains about three hundred birds, of which sixty-eight are foreign. The curators feel extremely anxious to complete and classify the collection of British birds and quadrupeds, in which, it may be observed that many members of the Society have the power materially to assist them. They gratefully acknowledge many presents made to this branch of the museum, and are desirous to allude more particularly to the numerous specimens received from Sir Charles Throckmorton, who has repeatedly contributed to several departments of the collection, but especially to that of birds. Some progress has been made in the formation of a collection of birds' nests and eggs. Few parts of England more abound in all the varieties of song birds than the well-wooded parts of Warwickshire, and with moderate assistance specimens of them all might soon be exhibited in the museum. Specimens of sea birds are very much wished for, and also winter birds. When rare birds are met with, it is desirable that the locality in which they are found should be mentioned. The nests of birds will be rendered more valuable if sent with portions of the branches to which they are attached. In the entomological section a few specimens only are possessed, but this part of the collection is likely soon to be much increased. In certain instances, the nests of the animals belonging to this division are highly worthy of preservation, as may be seen by the specimens of the nest of the Marabunta, the Common Hornet, the Wasp, &c., already in the museum. The collection of shells is deficient; it contains some good specimens. Of quadrupeds and of fishes, very few have yet been received. The number of quadrupeds is only twenty-five, that of fishes is still smaller; but it is hoped that a perfect collection of the fishes of the Avon may soon be made. Of the reptile tribes, some have recently been presented. The council entertain hopes that, as the collection increases, not only will the arrangement of the different specimens in the zoological department be such as to illustrate the leading divisions of Natural History, but that they will become more fitted for the instruction of those who feel interested in comparing the structure of different tribes of living beings. Several skeletons of the smaller quadrupeds and of birds are in the course of preparation, which, added to those now in the cases, and to the col-

lection of skulls of animals and human skulls, and the casts of skulls of the different varieties of the human species, with the specimens of parts of the osseous system of the larger mammalia already in the museum, will soon be sufficient to illustrate the frame-work, or bony structure, of vertebrated animals. The illustration of internal structure is a larger task, and demands larger resources; but no one can doubt that it may be effected, even by a provincial society, when it is remembered that splendid museums of comparative anatomy, and even of Natural History in all its branches, have occasionally been the work of single individuals.

ARCHÆOLOGY.—There is one portion of the collection, apparently devoted to mere curiosities, but which in reality illustrates no less important a subject than the natural history of man; a consideration which gives value and utility to the specimens of the dress and manufactures, the weapons and instruments of chase, of the Islanders of the South Sea, of which specimens several are deposited in the Society's museum. Much of the interest belonging to the archæological department arises from like considerations. The building materials, the costume, the money, the armorial devices of each age, are so many illustrations of man's social progress, and illustrate, scarcely less than purely literary remains, the exercise of his natural endowments, in all varieties of time and circumstance. The head of a Deer implanted in an Ash tree, the nest and eggs found in the centre of an Elm, and the portion of an Elm in which a fragment of Sandstone is imbedded, are, to a certain extent, illustrative of botanical physiology, as well as highly curious in themselves. Specimens of dried plants were, some time ago, presented to the Society by Mr. Leighton and Mr. J. Baly. Opportunities have not occurred of adding to this department, but it is in contemplation to make a collection of the plants of the county. Several books have been presented to the Society, and it is expected that the library will soon be enriched with more works relating to different branches of Natural History, including useful manuals in each department. The council also strenuously recommend the preparation of descriptive catalogues of each portion of the collection, as calculated very greatly to add to the advantages of the Society, as soon as this is found to be practicable.

ASSOCIATION FOR EXPLORING CENTRAL AFRICA.

WE have just seen and hastily perused a *Catalogue of the South African Museum, now exhibiting in the Egyptian Hall, Piccadilly*, for objects particularly entitled to the fostering patronage of naturalists, philanthropists, and a patriotic government. This museum contains an extensive collection of new and rare quadrupeds, birds, and reptiles from the interior of Southern Africa, with numerous specimens of the arts and manufactures of the natives, and about four

hundred drawings illustrative of the character of the country and its productions, of the manners, costumes, and social condition, and of the religious ceremonies of the inhabitants.

This valuable and curious collection is the property of a society which exists in South Africa, under the title of "The Cape of Good Hope Association for Exploring Central Africa." It was formed in 1833, by the first party sent into the interior from that Association, soon after its institution. The collection has been sent to England, first for exhibition and then for sale, in the hope that the proceeds will materially add to the very small fund arising from the voluntary contributions of a few colonists, and thereby render it practicable to dispatch in the course of next year a second expedition to resume an exploration of the country at lat. 23° 28′, where the investigations of the first party were discontinued.

Having no view beyond the advancement of knowledge and the benefit of mankind, the Association appeals to the best feelings of a highly-intelligent nation for that degree of support which cannot be expected from a few colonists, however zealous and liberal; and that they have been both the one and the other, is clearly manifested in the fact of their having contributed, in the course of a few months, the sum of nine hundred pounds, exclusively for the encouragement of discovery. With this and the sum of three hundred pounds, which was nobly placed at the Society's disposal by Mr. M'Queen, of Glasgow, so well known for his writings on colonial affairs, the directors of the institution have hitherto been enabled to defray all its expenses.

Although descriptive of a portion of the collection, this catalogue is not intended to offer any details beyond such as it may be reasonably supposed will be both intelligible and interesting to visitors in general: more important and strictly scientific remarks are necessarily reserved for publication in another form. The Association candidly avows a special anxiety to interest the public in its proceedings, as its objects are not likely to be accomplished without a more extended patronage. With a view, therefore, to make known the origin of the Society and its projected enterprize, with the steps already taken for accomplishing the latter, a series of extracts from the Records of the Association are prefixed to the Catalogue, by way of introduction. Among others passed by a general meeting held at Cape Town on the 19th of May, 1836, Sir John Herschell in the chair, is the following resolution:—"That the successful return of the expedition holds out so favourable a prospect of future discovery, that it is expedient that this Association should not be dissolved, but should continue to exist as a permanent institution for the further prosecution of its original object."

Three hundred and thirty-nine zoological articles are specified on the pages of this Catalogue; and of that number forty-seven were first discovered by the expedition, and subsequently described in a separate publication. Among these fruits of the Society's researches

is a new species of the Rhinoceros, with several important additions to the winged tribes; and as many curious observations on the habits and other characteristics of the more remarkable and rare animals preserved in the Society's collection are concisely introduced into the Catalogue, it is thereby rendered more worthy of public attention and patronage.

Dr. Andrew Smith is preparing for publication a *Journal of the Expedition*, which will comprise a great diversity of valuable information respecting the native inhabitants, the country and its natural productions.

LITERARY AND SCIENTIFIC INSTITUTION OF STAINES.

This Society completed its third season in the month of June last, and the last Lecture was delivered by the Rev. Dr. Jones, Vicar of Bedfont and Vice-President of the Institution, who had already printed five discourses addressed to the same Society, and now sends this one forth to share the fate of its associates. It is a vigorous and animated lecture, sparkling throughout with a brilliant and generous enthusiasm.

During the third season of the Staines Institution, which occupied eight whole months, a lecture was delivered every week, with a few unavoidable interruptions. In the first season eleven lectures only, in the second sixteen were given, but in the last they amounted to thirty-one; and, says Dr. Jones, who commends them, all these exertions were gratefully acknowledged by a full attendance of the members, by their kind encouragement and warm applause.

Dr. Jones's lecture will be perused with intense satisfaction by all those who cordially engage in undertakings similar to that for the promotion of which he devotes the best energies of an active and vigorous mind. Some of his powers and his principles are manifested in the following observations:—"We certainly live in changeful days; but it is true philosophy boldly to meet events, and convert them, if possible, into blessings. The general dissemination of knowledge is, perhaps, the most startling of the moral phenomena of our times. Heretofore, influential individuals there have been, anxious and active to forward the cause of popular enlightenment, but they found few of kindred zeal to aid the noble work; nor was there greater encouragement from the people themselves. A brighter day has dawned upon us. Ignorance has no longer the patronage of high authorities, and knowledge is discovered to be not only the privilege but the happiness of a people. Not that the path is even now so widely opened, or so freed from obstacles, as it soon will be. We have not yet swept away all the little prejudices and fears which retard the march of truth; still, much has been done, and more benevolently contemplated, and this very contemplation has its use. Nor

is past success without its incentives; it affords the best basis whereon to rest our hopes of larger and more abundant results. A Christian, and, consequently, a truly benevolent philosophy, carefully contemplates all great and fresh exhibitions of mental power, and moulds them with gentle and plastic adaptation to produce the greatest public good. Aided by such a philosophy, we shall not rudely and insultingly attempt to sully and destroy existing establishments, but rather look for their improvement to the sure, though scarcely perceptible, corrections of time."

Dr. Jones's pages overflow with excellent and instructive precepts, expressed with peculiar and attractive fluency. The following extract compels us to view his objects with respect, and his endeavours with admiration. "Ignorance has had its day," he observes, "and it has failed: the alternative problem is now in progress of solution. The experiment is on its trial, how far literary and scientific knowledge will avail in raising the character of a people, and influencing the destinies of a great kingdom. Say what we will, and do what we please, the impetus cannot be stopped or impeded. We can no more arrest its march by our narrow fears and impotent cavils, that we can roll back the flowing tide of the sea with the palms of our hands. If this be so, what should be our aim? Why, never to decry or oppose the pursuit of human knowledge when this is not made an antagonist principle to our faith as Christians, to our duties as subjects and citizens. On the contrary, let us resolve to diffuse the blessings of useful knowledge and to advocate its cause, not timidly or partially, but strenuously, unsparingly, and conjointly. Faith and knowledge must not be considered rivals, under whose banners enemies are to be enlisted; as representing an antipathy between the two revelations of God, the written revelation of his holy word, and the unwritten page of Nature—between the precepts of the Bible, and the great truths which the science of social economy is hourly eliciting. The gospel of salvation and human knowledge must be joint, as they are confessedly gigantic, levers in the moral and mental amelioration of mankind. Let us, then, give the Bible with our right hand, and the volume of man's wisdom with our left. Let us persevere with the liberal views and cordial tempers which have hitherto guided our councils and rewarded our zeal, and yet fuller as well as riper harvests will follow. And, above all, let us be determined, in spite of every difficulty and trial, to *keep the unity of the spirit in the bond of peace.*"

As a "rural philosopher," Dr. Jones admits that a magazine, cleverly conducted, cheap in price, and mainly confined to reports of the formation and transactions of provincial societies, could not fail of being widely and influentially useful. We entertain the same opinion to its fullest extent, and we shall continue to hold, as we have always done, the pages of *The Analyst* open for the reception and recommendation of reports from such institutions, when guided by the principles which have obtained the Vicar of Bedfont's most eloquent and

irresistible advocacy. We also join most cordially in the sentiments of Dr. Jones when he says "I want literature and science to penetrate into dark, unchronicled, unexplored spots. I want to see the great work of mental illumination active and encouraged through the length and breadth of the land. What though the tree of human knowledge does not yield pure or perfect fruit, we are not to abandon its cultivation, and content ourselves with the weeds of ignorance. Let us rather aim to graft it upon the tree of life, that thus, budding on an immortal stock, it may gladden our earthly sojourn, and nurture us, with the Divine help, for more exalted blessedness hereafter."

CAMPSALL SOCIETY FOR THE ACQUISITION OF KNOWLEDGE.

AMONGST the various and numerous societies whose transactions we have from time to time recorded during the last few years, there is not one whose establishment or success gave us such sincere pleasure as did that of the institution now for the first time introduced to our readers and the public. All tend either to the advancement or the diffusion of knowledge (we will not say of "*useful* knowledge," for what knowledge is not useful?), and therefore all have our hearty good wishes and our feeble support. But the Society of which we have just given the title is established for the benefit and improvement of the *labouring classes*. It were impossible to give more than an outline of its plan and objects, but these are so novel and important that, in the sincere hope of promoting the establishment of similar institutions in other parts of the country, we will present a brief account of what it has already effected.

The members are either ordinary or honorary; the former pay 1d. per week, the latter 7s. 6d. a year, or a composition fee of £1., all payable in advance. The ordinary members consist of labourers, artizans, farmers, &c., the honorary of such gentlemen as choose to join the Society with the view of promoting its objects by delivering lectures, &c. The members are already upwards of forty in number. The following are the names of the honorary members:—Charles Thorold Wood, Esq., Willoughby Wood, Esq., Neville Wood, Esq., C. T. Wood, jun., Esq., William Thorold Wood, Esq., G. C. Yarborough, Esq., M. Tasburgh, Esq., Mr. Keyworth, Mr. Gillatt, Mr. Hindle, Mr. Sykes, Master A. T. Wood, Mr. Lankester, Mr. Chiosso, Mr. Porter, Mr. Marschan, Mr. Barnewall. Donations of £1. each have been presented by C. T. Wood, Esq., Willoughby Wood, Esq., Mrs. Wood, and Mr. Lankester.

June 16th.—The first general meeting of the Society took place at 8 o'clock, p.m., Willoughby Wood, Esq., in the chair. The chairman, Mr. Lankester, and Mr. Chiosso, severally delivered very appropriate addresses on the advantages and uses of knowledge, and on

the objects of the Society. Mr. Lankester observed that were he asked which would be most beneficial to Campsall, the discovery of a gold-mine in its neighbourhood, or the establishment of this Society, he should, without hesitation, declare in favour of the latter. He continued, "You have established a society for the acquisition of knowledge, not in this *city*, not in this *town*, but in this *village*, and, so far as I am aware, it is the first society of the kind that has sprung up in so small and secluded a spot." The rules having been proposed, seconded, and passed, the names of the honorary members and committee were read. A vote of thanks was proposed to Charles Thorold Wood, Esq., of Campsall Hall, the founder of the Society, which was warmly responded to, and the meeting adjourned.

June 29th.—The third meeting took place, Mr. Abson, tailor, Campsall, in the chair. Willoughby Wood, Esq., delivered a lecture on Knowledge, introducing, incidentally, some very appropriate observations on wages.

July 5th.—*Fourth Meeting*, C. T. Wood, Esq., in the chair.—Mr. Lankester delivered an extremely interesting discourse on the Steam-engine, Electricity, Botany, Anatomy, and Chemistry, interspersing the lecture with anecdotes and experiments, and illustrating it with diagrams. The lecture appeared to excite considerable interest, and marked attention was paid throughout. At this meeting it was agreed to admit such inhabitants of the neighbouring village of Norton as chose to join the Society as ordinary members; also to take in the *Penny Magazine*, Chambers' *Edinburgh Journal*, and Chambers' *Information for the People*. To these works will probably be added the *Magazine of Domestic Economy*.

July 13th.—*Fifth Meeting*, C. T. Wood, Esq., in the chair. The chairman recounted the heads of the discourse delivered last week, in order to impress it on the minds of the auditors. Mr. Lankester then delivered a lecture on Botany, illustrated by diagrams and specimens of plants. The vegetable tissues, the parts of plants, and the most familiar modes of classifying them, were explained in a popular and interesting manner; though at the same time—however fascinating Botany and vegetable anatomy may be to those accustomed to study them philosophically—it may well be questioned whether the subject is not somewhat dry and unintelligible to an uncultivated mind. We must "give milk to babes;" and, despite the able manner in which the learned lecturer acquitted himself, it cannot be denied that the attention of at least a portion of the audience began to flag long before the conclusion, a circumstance which cannot be too scrupulously guarded against.

July 20th.—*Sixth Meeting*, C. T. Wood, Esq., in the chair. The chairman commenced the business of the evening by calling upon any of the members to rise and give an account of the lecture delivered by Mr. Lankester last week. After a few minutes Mr. Procter, schoolmaster, of Norton, rose, and observed that he had waited in the hope that some one of his boys would have come forward and

complied with the wishes of their respected chairman; but that, as they were too shy, he would take the task upon himself. He then proceeded to enumerate the heads of the lecture, in a manner which elicited the enthusiastic applause of all present. That an individual who had, perhaps, scarce heard the name of Botany before should be able to give so correct a summary of Mr. L.'s lecture was certainly encouraging, and it proved—what we never doubted—that at least some of the members were fully competent to comprehend the lecture of the preceding week. Mr. Wood then proceeded to give some account of the *Penny Magazine*, reading portions from the first number, and explaining them where necessary or desirable. The chairman's observations on drunkenness were particularly good, and the whole discourse was suited in an admirable manner to the minds of the auditors. The chairman was frequently applauded, and the customary vote of thanks at the conclusion was warmly responded to.

At the seventh and eighth meetings, on the 27th of July and the 2nd of August, familiar lectures were delivered on Phrenology, by Mr. C. T. Wood, jun. The first of these was devoted to a brief outline of the science, the second to a description of the uses and abuses of the various organs, illustrated with drawings and anecdotes. By some the very idea of lecturing on Phrenology to an audience of labourers and farmers may be stigmatized as absurd. But surely it is interesting and useful to every one to be acquainted with the composition and functions of his own mind! Every one knows that the lower classes take the greatest interest in Anatomy where the opportunity is offered to them; and he who believes that the study of the philosophy of the mind would prove less fascinating to them than that of the body is himself no philosopher. Suffice it to say that such was the interest excited by the lectures already delivered on Phrenology that it will probably form the subject of many future discourses.

Hitherto the members have met together one evening in each week to hear any lecture that may have been prepared for them, and at each meeting books are distributed amongst the members. Those who have witnessed the large and attentive audiences at these lectures can easily anticipate the immense advantages which must necessarily result from the establishment of similar societies in other parts of the kingdom. To those who oppose the education of the lower classes altogether, as detrimental to the interests of every party, our observations are not addressed. Such individuals are either too ignorant or too bigoted to be worth notice. But the philosophic phrenologist well knows that every man, except an idiot, has the same faculties, that these differ only in relative size and quality; he knows also that these faculties can be cultivated to equal advantage, and with equal pleasure, by individuals of all ranks in life, and he acts accordingly.

We can only hope that the Campsall Society for the Acquisition of Knowledge will continue to exert the same zeal which has hitherto actuated it, and that the influential inhabitants of other vil-

lages will follow the example of those of Campsall and its vicinity. Extend this plan to England, Europe, and the world, and then indeed we might, at no distant period, hope to see that glorious consummation spoken of in Holy Writ, "*Knowledge shall cover the earth, even as the waters cover the sea.*"

We shall take an early opportunity of giving a further account of the proceedings of this institution, and in the interim wish it the success it so well merits.

It may be observed, in conclusion, that custom appears to have reconciled all parties to the Mechanics' Institutions for the benefit of the inhabitants of towns. That the same feeling may ere long occupy our minds with regard to societies for the instruction of the now benighted dwellers in villages and the country generally, is our sincere wish.*

CRITICAL NOTICES OF NEW PUBLICATIONS.

The Spas of Germany. By A. B. Granville, M.D., F.R.S. 2 vols. 8vo., pp. lxii., 946; with Tables and thirty-eight Plates. London: Colburn. 1837.

Ever since the time when disease began to make encroachments on the office of old age, in continuing the natural vicissitudes of human existence, the prolific ingenuity of man has never ceased to be exercised in discovering and devising means for the conservation or recovery of health with its universally desired accompaniments—happiness and longevity. Among the multitude of resources usually employed for attaining these highest of enjoyments, not the least efficacious has long been the use of mineral waters under their saline, chalybeate, and gasiferous kinds, and at all their practicable diversities of application and temperature.

Mineral springs are abundantly distributed over the various regions of the globe, and more than two thousand of them are frequented by invalids and convalescents in quest of benefit from their medicinal virtues. Dr. Granville's volumes are occupied with observations on thirty-six of the German watering-places; and his account of these is both entertaining and instructive.

Having explained the general objects of his work in a concise preface, the Doctor gives a comprehensive introduction, which con-

* The readers of *The Analyst* are indebted solely to Neville Wood, Esq., for this communication.—Ed.

sists of "Popular Considerations on the Use and Power of Mineral Waters," and his considerations are arranged under distinct heads. Under one of these he endeavours to expose the prevailing ignorance of the "most influential medical men in London" respecting the nature and use of foreign mineral waters. His evidence in support of this simple proposition is not distinguished by anything new, either in kind or quality: it is based on two cases and repeated examples; and, all these being facts, the proof is a demonstration. Dr. G. next evinces most clearly that the foreign mineral waters are endowed with remarkable efficacy and power; but it is not a part of his plan to show that the British mineral springs are equally powerful as the German; and that some of them, by the same plea, are greatly more efficacious. When treating of temperature, the Doctor concludes that the heat of mineral springs would seem to be *specific* in its action, and therefore dissimilar from ordinary heat: but whence this peculiar heat is derived, he says, no philosopher has as yet satisfactorily explained. By some inadvertency, however, he omits mentioning the process by which he ascertained that the results whereon he grounds his seeming conclusion were produced by the "thermal or telluric heat" exclusively, and not by the gaseous or mineral elements held in combination by the thermal water. Nevertheless, there are creditable reasons for imagining that there may really be different kinds of heat; for, in his "Popular Considerations," Dr. Granville makes it plain that an excess of "thermal caloricity" may be communicated to a frigid looker through the history of inductive sciences, for a key to unriddle the great mystery of permanent heat in mineral springs. His next section unfolds the Doctor's views on the mode in which the mineral waters act, and how they ought to be employed. It is his decided opinion that these waters, when acting successfully on the human system, act as *alteratives:* and whether they do so by changing the character and composition of the fluids of the human body, or by effecting an *alteration* in the solids, it is not less true that it is only as *alteratives* they have been acting. This discovery will be hailed with grateful admiration by the most influential medical men in London, and by the members of that society which, in England, is looked upon as the *ne plus ultra* of scientific academies. The manner in which mineral waters should be used, so as to obtain their alterative effects, is various. The Doctor says they may be taken internally, or they may be used externally as baths. He propounds an ingenious theory on the origin of mineral springs and the antiquity of mud-baths. Mud mineralizes the springs; and although the application of the mineralizing mud of a spring be itself unknown in this country, and is of comparatively recent introduction at the Spas of Germany, yet the use of mud-baths in disease is of great antiquity. In one of the Gospels, the Doctor finds evidence of the practice of using mud-baths having existed in scriptural times, for the cure of the "impotent folk, the blind, the halt, and the withered" or paralytic. He adds in illustration that "the angel who went

down at a certain season into the pool to trouble the water" before the sick could enter it, is evidently figurative of the periodical or occasional muddy condition of the pool of Bethesda, produced by the town-physician making the waters turbid, and thus putting them into the best state for medicinal and sanative purposes. Dr. G. proceeds to repeat the "popular considerations"—that the journey to the Spas of Germany, change of air, difference in the former mode of living, release from laborious occupation, leaving behind of every worry and anxiety of mind, gaiety of the spas, and the constant amusement to be found there amidst agreeable society, all act as auxiliaries to the power and virtues of mineral waters. He grants, with great candour, that these auxiliaries act as *adjuvants* in the cure, but never as principal agents; that they serve to hasten the recovery and render the treatment more pleasant; and that in many cases they seem to be essential to the development of the power (not of the effects) of the water. Dr. G. concludes, from a perfect and impregnable induction, that the difference between an English and a German spa is very considerable, and that the balance is greatly in favour of the latter: and by the same induction the Doctor imposes an immense debt of gratitude on the English people for the sagacity and eloquence with which he endeavours to persuade them that the Spas of Germany are fraught with benefits every way unparagoned.

Dr. Granville's method of defining the special objects in using mineral waters is very philosophical. If it be true, he says, that mineral waters possess great medicinal powers, their use must pre-suppose a *serious* purpose, which purpose is either to cure a present disease, or to mitigate it, or to prevent a threatening one; and therefore he infers that most individuals use the waters as a *means of cure*. Experience has enabled him to disclose the information that, in curing, mitigating, or preventing disease, we have often need of more than one mode of action on the part of the agent employed for those purposes. We require, he says, either a purely restorative or a purely corrective agent, or both modes (he means agents) may be necessary at one and the same time, either in equal or in differently proportioned degrees of such agents. Hence he has ascertained that three classes of mineral waters may be established at once, founded upon these three modes of action, which shall meet every case likely to present itself at a mineral spring; and that between the four ends of Germany there are spas endowed with the qualities we have need of for furnishing the three required modes of action. The Doctor concludes this instructive branch of his "Popular Considerations" with the pleasant intelligence that, in Germany, the people enjoy as good health as in this country, and do not die in larger numbers under ordinary circumstances.

"Rules for the Use of Mineral Waters, Regimen, and Diet" involve topics of vital importance to those individuals who frequent the Spas of Germany, where the dinners are delightful and the society is exquisite. Dr. G.'s "Rules" are extremely judicious, and

agreeably distinguished by his characteristic originality, conciseness, and precision. Experience and contemplation led him to the discovery that "a moderately-nourishing and easily-digested dinner suits all patients." As a finisher to the "Popular Considerations," their inditer pours forth a pathetic effusion, by way of illustrating the vivacity of his patriotism and the disinterestedness of his philanthropy. "In conclusion," he observes, "I would say to such as are able and willing to try the effect of some one of the German Spas, in hopes of casting off any disease under which they may have laboured at home with little hope of recovery,—haste away, and make the trial by any means. Do not waste your life and your purse in swallowing endless drugs, and ringing the changes of remedies and doctors, pent up in a hot house in London during the summer months, or in being lifted in and out of the carriage, the prey of some chronic and insidious disorder, which baffles your vigilant physician's skill; or in being sent from Brighton to Tunbridge, and from thence to Leamington or Cheltenham, merely to return again to Brighton or London exactly as you left it, having in the mean time tried as many doctors as places to no purpose. Fly, I say, from all these evils, proceed to some spring of health, and commit yourself for once to the hands of Nature—medicated Nature—assisted" [by the "physician of the place," and] "by every auxiliary which an excursion to a German spa brings into play; and depend upon it that either at the first, or at the second, or third," or some other occasion of "visiting and using such spa you will have reason to rejoice that you exchanged Art for Nature."

Dr. G. believes that there does not exist, in any language, "a work presenting the narrative of a grand tour to the most celebrated and fashionable *mineral watering-places* of Germany in regular succession; a tour in which amusement is blended with information, and descriptive sketches of the humours and fancies of each spa are mixed up with the accurate details, collected on the spot, of every thing that is useful in a medical and social point of view." He doubts not that "a work of this nature is sought for by all those who wish to visit the Spas of Germany;" and he hopes that the wishes of these amiable persons may be perfectly answered by the benevolence of his beautiful volumes. He "recommends this great tour to all idlers as a summer diversion, instead of broiling, at double the expense, at Brighton;" and he commences his own toils on the 13th day of August, 1836, by entering the land of Spas in an open britschka, the best sort of machine for framing observations, for adjusting facts, and for arriving at medical and social or poetical conclusions. His narrative is luminous and sprightly; he enlivens it with a fair proportion of the seeings, and sayings, and doings, of an experienced traveller; and by means of these, still farther enlivened with picturesque sketches of things, and places, and persons, he has succeeded most happily in making a book well qualified, by its value and gentility, to become a proper companion to those who follow

Dr. Granville's excellent advice, and haste away to commit themselves to the hands of *medicated* nature at the Spas of Germany.

Dr. Granville descants agreeably on his Spas under four distinct geographical groups. The first is his Baden-Baden and Wurtemburg group, and it includes his descriptive sketches of the Baden-Baden, Rippoldsau, Wildbad, Liebenzell, Deinach, Cannstadt, and Boll spas, on each of which he bestows a due share of friendly and philosophical attention.

Baden is "Queen of the Spas of Germany," the second most historical bathing-place in Europe. The place forms a most delightful summer retreat of the sick and the healthy, and it lies in the bosom of a most enchanting mountain scenery. You become almost romantic as you approach it on a road which keeps meandering into the bosom of the valleys; and when at length you enter the town, through a long avenue of poplars terminating in a shaded road, the sudden freshness is felt to be particularly delightful. By hills, the queen of spas is sheltered from the east winds and from the westerly gales; and on the north side her protection is still more complete, owing to the greater elevation of a mountain range. The place is only a few hundred feet above the level of the sea: there are some few degrees of thermometrical heat in the valley of Baden more than in the flat country near and out of it. At the moderate height of its position it enjoys a dry and very pure air, which exerts, as Dr. Kramer observed, a happy influence on the moral as well as the physical part of man. Dr. G. is disposed to think that this representation is not one of the exaggerations which physicians of watering-places indulge in, in behalf of their favourite spot of residence. The climate here is exceedingly temperate, and one of the most healthy in Germany.

Apparently a prodigious multitude of persons frequent this delightful retreat during the bathing season; "but," says Dr. Granville, "at Baden a little trickery is resorted to in this matter, just to raise its character by showing that a larger number of visitors flock thither than to any other Spa, for the benefit of its waters." He calculates, from observation of gait and countenance, that not one in a hundred of the many people seen there can possibly have the excuse of ill health for resorting to the place. Yet it has its patients, and many such there are who could not stay away from it, or change it for another place, without losing every chance of recovery.

There are eleven secondary mineral springs at Baden, besides the celebrated Ursprung, which pours out a profusion of thermal water, at a temperature only 58° short of the boiling point. According to Dr. G., this scalding water is used for almost every domestic purpose, including most of the culinary operations. It is, he says, perfectly clear, has a slight faint animal smell, a taste somewhat saltish, and, when drunk as it issues from the spring, approaching to that of weak broth; but, he adds, this taste becomes less pleasant by the mixture of cold water, milk, whey, or other ingredient. Its specific gravity is 1.030, that of distilled water being 1.000; a pint of it

contains nearly twenty-four grains of solid matter, comprising sixteen grains of common salt, six grains and a half of the sulphate, muriate, and carbonate of lime, and a small portion of magnesia, with traces of iron and about half a cubic inch of carbonic acid gas in addition. Its particular smell is due to the presence of extractive matter and of bath slime, a peculiar vegeto-animal substance, which hot-springs deposit at the bottom of reservoirs. When employed injudiciously, this excellent water sometimes occasions some injurious effects; when rightly used it, in some cases, produces beneficial results. A gay life may be led at Baden on very reasonable terms.

Travellers to the Wurtemberg Spas will be greatly exhilarated and edified as they go by the discursive and sensible observations recorded by Dr. Granville on his journey to the same destination; they are full of interest, novelty, and importance. He promises not soon to forget the delicious sensations for which he is indebted to that charming excursion. In his opinion the inhabitants of the Schwarzwald, or black forest, are ugly, and many of them are afflicted with goitre, or neck-wens; but the natural scenery of that upland region abounds with variety and loveliness. Nothing, he thinks, can equal the succession of beautiful changes which, at each turn of the road, present themselves to those who ascend the river Mourg and its enchanting valley. Like all mountain streams, this is insignificant at its source, which is double, near the highest summits of the forest; but it soon gains strength, and rolls onwards through its tortuous windings, more capricious than the coils of a great snake, or becomes precipitous, rapid, and boisterous. The Doctor could not help admiring the valley of Baiersbroun, surrounded by broken masses of rocks and lofty mountains—the wild cradle in which the romantic Mourg starts into existence.

Mineral springs abound in these regions. The Griesbach is a medicated water, charged with a predominant proportion of glauber salt; the Rippoldsau is a pleasant beverage, resembling Seltzer water in a great degree, as to taste. Both these springs are used as baths, which are accompanied with good accommodation for visitors, including two capital hotels and gambling-rooms. Large quantities of the Rippoldsau water are exported in earthern bottles, but little of it goes beyond the German frontier. Though highly sapid and even *piquante*, particularly when mixed with the *vin du pays*, there is in this water an after-taste of astringency, which is by no means agreeable.

Wildbad lies amidst the wilds of the Schwarzwald, whose mighty and columnar Firs give a sombre yet grand character to the country. On taking a hot bath at the *Fürsten*, or prince's bath, Dr. Granville found the water wonderfully affective, and this circumstance led him to institute a process of inquiry and reflection concerning the causes of its effects. It was a very nice bath indeed, and having enjoyed the luxury of an immersion in its waters, he thus describes the event in terms of grateful eloquence:—

"Having undressed in an adjoining room, where I found a sofa, chairs, a table, with a mirror, a carpet, and warm linen, I entered the bath at an hour when no other person was present. After descending a few steps from the dressing-room into the bath-room, I walked over the warm soft sand, and I laid myself down upon it, near the principal spring, resting my head on a clean wooden pillow. The soothing effect of the water, as it came over me, up to the throat, transparent as the brightest gem or aquamarine, soft, genially warm, and gently murmuring, I shall never forget. Millions of bubbles of gas rose from the sand and played around me, quivering through the lucid water as they ascended, and bursting at the surface to be succeeded by others. The sensation produced by these bubbles, as many of them, with their tremulous motion, just *effleurasent* the surface of the body, like the much-vaunted effect of titillation in animal magnetism, is not to be described. It partakes of tranquillity and exhilaration, of the ecstatic state of a devotee, blended with the repose of an opium-eater. The head is calm, the heart is calm, every sense is calm; yet there is neither drowsiness, stupefaction, nor numbness: for every feeling is fresher, and the memory of worldly pleasures is keen and sharp. But the operations of the moral as well as the physical man are under the spell of some tranquillizing agent. It is the human tempest lulled into all the delicious playings of the ocean's after-waves. From such a position I willingly would never have stirred. To prolong its delicious effects, what would I not have given? But the Bad-meister* appeared at the top of the steps of the farther door, and warned me to eschew the danger of my situation; for there is danger even in such pleasures as these, if greatly prolonged. I looked at the watch and the thermometer before I quitted my station. The one told me I had passed a whole hour in the few minutes I had spent according to my imagination; and the other marked 29½° of Reaumur, or 98¼° of Fahrenheit. But I found the temperature warmer than that whenever, with my hand, I dug into the bed of sand, as far down as the rock, and disengaged myriads of bubbles of heated air, which imparted to the skin a satiny softness not to be observed in the effects of ordinary warm baths."

This bewitching water has neither taste nor smell; it is colourless, transparent, and brilliant. That it is of the purest softness is evinced by the cosmetic and striking changes it readily produces on the skin. Its chemical composition, according to Dr. G.'s judgment, is probably one of the simplest in nature; it contains not more than three and a half grains of "fixed principles" in a pint, and of these common salt makes just one-half, the rest consisting of carbonate of soda and glauber salt, sulphate of potass, carbonate of lime, and the carbonate of magnesia. With regard to its gaseous or aëriform contents, there is, 1st, the small quantity of gas which is disengaged by *boiling* the water; and 2nd, the gas which rises naturally from the spring, in numerous bubbles. The chief and predominant merit of the Wildbad water is its temperature, and this has continued the same throughout a long succession of years. After mature consideration of the subject, the Doctor confesses that he has been led to ascribe to the *temperature* of this and other warm mineral springs the principal effects which they produce on the human constitution. But it is not the *thermometrical* temperature to which he alludes when he proclaims this opinion; it is to the *caloricity* of the water

* The person known as the "bath-man" in England.—Ed.

which is not to be measured by Reaumur or Fahrenheit; a principle imparted by nature to such springs, from sources that, as yet, have escaped detection, but which, at no distant period, will probably be found to be connected with electrical powers, and, therefore, not appreciable by the ordinary instruments of thermometrical mensuration. Altogether, the small village of Wildbad appears to have left favourable impressions on the affectionate disposition of Dr. Granville, and he records the kind sentiment that this pleasant little town is equal, if not superior, to most of the principal Spas of Germany, in the beauty and romance of its environs, the mystery and tradition which attaches to some of them, the geology of its neighbourhood, and the rich harvest it offers to the botanist. The waters of Wildbad cure some affections and relieve some diseases: its air is pure and bracing; and, in general, its climate during the three months of the bathing season is unexceptionable.

Another of the many "mountain bosoms" of the Schwarzwald, is the valley of Nagold; and in this enchanting region stands Liebenzoll or love-cell, a small town which possesses a "spring of health" whose powers and virtues have proved of essential service where the magical waters of Wildbad were found too irritating or inappropriate. At this lovely spot the mineral spring has a temperature of about 77° F., and a pint of it contains 4¾ grains of saline ingredients. Its taste is slightly saltish, and in appearance the water is beautifully clear and transparent. It has performed some very striking cures, which Dr. G. enumerates.

Deinach is situated four miles from Wildbad, in the heart of the Black Forest: it has two kinds of mineral springs, which rise close to each other in a sandstone rock. One of these yields an acidulous water, pure, pellucid, and sparkling: the other supplies a turbid water of a greenish colour; it deposits a large quantity of oxide of iron, and its taste is intensely styptic. The temperature of these springs is about 45° F., and it never alters under any variation of the weather: they act beneficially in several diseases. Every thing is moderate in this sequestered retreat; but Dr. G. should never make it his summer residence, even with that advantage.

Cannstadt is a neat and pretty little town, with gardens and promenades which brought strongly to Dr. Granville's mind the delicious parterres and groves of Aranjuez. Sulzrairquelle is its principal spring, and sixteen ounces of this are impregnated to the extent of forty-six grains, with common salt, Epsom and Glauber salts, the carbonates of lime and iron, and a little carbonic acid gas: its temperature is 66° F. This water is pleasantly acidulous, *au premier gout*, the Doctor says; but it leaves behind a smack of rusty iron, with corrugation of the mouth and tongue, and a taste of common salt into the bargain, by no means agreeable.

Dr. Granville thinks the hotel König von Würtemberg, at Stuttgard, might very well be made the head-quarters of an invalid desirous of enjoying the benefit of the Cannstadt waters. At this royal house of entertainment, and for four sixpences too, he partook

of a savoury and substantial dinner, distributed into three courses of things with comical names, and a dessert with a pint of wine, which was not despicable. Inspired with the exhilarating repast, he jocundly exclaims, "What cockney within the smoke of the kitchen of the Albion or of the Freemason's can hope to linger over, still less to partake of, the tithe part of this long list of *gustables*, at the bare name of which his mouth would water, for only twice twelve pence of lawful British money?"

Boll is a beauteous village: it has long enjoyed a national, and even European, renown. It is placed on an elevated plateau, formed on one of the pinnacles of the Suabian Alps: on the one side it is flanked by a ridge of these mountains, which extends as far as the eye can reach; while on the other side a dense forest comes down to the very edge of the village in its rear, and forms a dark background to the place, giving it an imposing character. The contemplation of the whole scene is full of interest, when the eye rests on the once mighty Hohenstaufen, the cradle of the German emperors.

The spring at Boll is sulphureous: it rises through a soil consisting of bituminous marl and a species of sulphureous gravel. Its temperature is 54° F., and its predominant saline constituents are Glauber salt, and the carbonates of soda, lime, and magnesia, with traces of iron and manganese, and strong indications of bitumen. Its gaseous contents are carbonic acid, azote, and sulphuretted hydrogen. It proves of essential service in diseases of the skin, scurvy, psora, and other "deturpating complaints;" in nocturnal pains of the bones from "erotic affections;" and in carious ulcers of the legs, contraction of the limbs, and lameness. It is a depurative of the blood, when this is vitiated. Dr. G. considers the mineral water of Boll, when taken internally, capable of producing the most happy results.

Provisions are cheap at Boll: it is a comfortable place: it offers to the visiter a scene of civilization in the way of public and private amusements, occupation of the mind, and social intercourse, which could hardly be expected in that lofty and secluded region. A band attends on week-days, and on every Sunday or Saint's-day there is dancing after dinner. The water is pumped from the spring by means of a tread-wheel: the environs are picturesque, the roads are good, and the main-road is excellent.

Dr. Granville offers as his reason for having purposely given a very extended account of the principal Wurtemburg Spas, the complete ignorance which prevails in this country respecting them, and the serious loss entailed by that ignorance to many thousands who might otherwise have found health at some of these watering-places. He adds that they are the least expensive of all the frequented Spas of Germany; that every one of them is situated in the centre of some romantic and beautiful region; and that, on these satisfactory grounds, they deserve and ought to command attention.

Having discharged his professional duty to the waters of Würtemberg and its highland scenery, Dr. G. takes his departure for

the Bavarian capital. He likens the districts he passed through during his journey to perpetual gardens: they are not limited by landmarks, nor do their crops of wheat or barley exhibit a single vestige of any weed or an intruding red poppy. Trees, single or in groups, occur sufficiently often to diversify and break the monotony of the extensive sheets of arable land outstretched before the view. The ever-changing series of hills was often interrupted by dense dark-green, and ancient plantations, from the small copse to the extended forest. In the valley of the Nagold, women were principally engaged in reaping with the scythe, and they seemed to get through their task with surprising rapidity. Before arriving in sight of Ulm the Doctor journeyed "through a road interesting to the geologist, and the lover of Suabian *antiquities*, in many parts of *which* the remains of ancient feudal and baronial castles appear planted in midway air, or on the summit of some of the most pointed and fantastic hills." He saluted the Danube, and indulged in a soliloquy: he saw the imperial abbey of Elchingen, and it made him contemplative. His sketches of Augsburg are brief, but graphic: it is an interesting city in many respects: one of its curiosities is the hotel of the Three Moors, which must be seen to be comprehended. The streets are paved with small stones, without any *trottoirs*, and are very unfavourable to the pedestrian; they hurt the Doctor's feet. On the road to Munich he had an illustration of the different manner in which climates affect different individuals, even of the same family, and all equally in health. After ascending the last hill by a tortuous yet excellent road, he caught the first glimpse of the snowy Alps, and here the effect of the air upon his spirits was suddenly marvellous, and continued through the rest of his journey. A buoyancy and elasticity came over his feelings which he hailed as totally new: he was evidently in a congenial climate, and the energy of all his faculties evinced how beneficial such a climate was to his constitution. On his two sons the effect was neither so striking nor so decidedly favourable; and this furnished him with the illustration.

Munich is the capital of Bavaria, and it is the head of Dr. Granville's *second* "geographical group," which includes the "Saltzburgean Spas;" and on this metropolis he exercises the spirit of topographic oratory with his usual vivacity and judgment. He gives a sublime prescription for combining the elements best calculated to effect the alterative process by which a city may be converted into the "Fair Queen" of an empire. The ingredients are these:—a higher state of knowledge, a greater encouragement to learning, the promotion of industry, the patronage of the liberal professions, the foundation of institutions suited to the times, the erection of vast and magnificent buildings, the cultivation of a pure and correct taste in architecture, in painting, and in sculpture, and a more enlightened government. Munich seems to have possession of these high requisites: at no distant period, the Doctor thinks, it will be the capital of South Germany. It bids fair to become the Athens

of Germany—it is a fair, a promising, a delightful capital. At this fascinating mother city he found an opportunity of expounding to Prince Wallenstein his most enlightened views concerning the nature of oriental cholera, and the secret of its pretended contagion. There is but one burial-place at Munich, situated outside the town; and, although vast, it is crowded to excess.

One fine morning as Dr. G. was journeying from Munich to Saltzburgh, the sun rose in the east before him, above the top of the loftiest pine ranges which intercepted its rays at its birth. The white mist gradually dispersed, and the myriads of gossamer webs that veiled the tips of every branch and shrub, first sparkled with their seed-like diamonds as they caught the first rays of the cheering planet, and the next moment their fairy texture, night-woven, was dissipated. Seeing thus the charms of morning, and feeling their benignant influences, the Doctor forthwith discourses with himself, and says, "Who would not witness, and, witnessing, could not enjoy, such an early morning scene; to catch Nature at her toilet, when her most delicate beauties are unveiled to our sight? Have we not here a solution to a part, at least, of the secret of health recovered and disease removed when distant mineral springs are visited? Does not the inhaling of the purest and most balmy air, enriched with aromas and probably with medicated effluvia from the surrounding plants, account for a portion at least of the recovery of the travelling invalid? For myself, at such a conjuncture I always felt as if my pristine vigour, impaired by a laborious life, had been restored to me for the moment; and I would have willingly loitered for hours together to enjoy the like spectacle and quaff the like draught of renovated vitality." With such inducements to visit distant mineral springs, the travelling invalids of Germany and Italy will certainly hasten in hundreds to the Spas of Brighton, Buxton, and Bath, and there obtain a portion of their recovery by inhaling the balmy air enriched with aromas, and probably medicated with the effluvia of woodbines and beans.

Saltzburgh is an old archiepiscopal city, having its gigantic citadel seated on a calcareous rock in the very heart of the place. It is situated in an amphitheatric basin, and offers so many natural beauties of every description to the eye of the inquisitive traveller, that it becomes quite an object of interest as well as admiration. Some of these beauties the Doctor sketches cleverly, and then puts himself *en route* for the wilds of Gastein, the road to which, he says, is both interesting and romantic, and as little known to Englishmen as the nature and powers of its mineral springs. His picture of a thunder-storm is inspiringly pathetic. He was traversing the midway region of a mountain range, along the tortuous and giddy windings of the impetuous Salza, and surrounded on all sides by enormous crags with a solid screen of alp on alp unreached before him. He was hastening onward with all possible rapidity for the bath of Gastein, his scope and object, when, he says, "during the night a thunder-storm burst over our heads, and the peals, echoing from

mountain to mountain, seemed to crash on some distant headland, only to make new echoes and to multiply the storm. The lightning leaped, and streamed, and quivered between each bellowing of the thunder, and seemed to threaten the stoutest rock and loftiest tree in the surrounding forests. The deep and fearful gloom left by the vanishing lightning was not so awful as the effect produced by its returning momentary splendour, which showed for an instant the dark abyss and dreadful chasms before us and by the side of us where none had been suspected. As if to impress us with the tremendous depths of these gulphs, the lightning would often, in zig-zag lines, run along their sides, or, like the hissing snake, unfold its coils to slide the more quickly down the bare rock. The whole scene was awfully sublime; and the distant, scattered, broad drops which pattered down, driven in all directions by the many gushes of wind that came sweeping through every mountain gully, left us no repose. Torrents of sheeted rain at last seemed by their diluvial power to silence the roaring of the gale and to quench the lightning's fire. Before the dawn of day Nature had once more lapsed into her solemn attitude of rest."

Gastein is seated on the highest pinnacle of one of the mountain-ranges which slope towards the valley of the Salza, nearly three thousand feet above the level of the Mediterranean sea. Dr. G. represents this as a very wonderful village, with its gigantic mountains, its roaring river, its majestic waterfall, and its mighty cataract, which descends, for 650 feet, nearly vertically from a shelving rock. Here he caught a patriarchal physician eating his noon-day dinner, *en demie chemise* with part of the viands lying on his knee, and part of them on a piece of furniture. This sedate personage welcomed the stranger to Gastein, and "hastened to resume his coat and waistcoat, smiling with an ineffable grin of black-teeth demonstration." The traveller protests, however, that his worthy entertainer had a much better furnished cranium than was expected; but the good man had one fault, he had become a proselyte to the dangerous heresy of *Infinitesimophysicalism*, as it stands in Dr. Granville's neological vocabulary!

From the precipitous rocks of Gastein five different springs pour out thermal water, at 116°, F., of temperature. This water issues without the smallest noise, and without forming any air-bubbles: it is as bright and as pure as the finest distilled water, and it almost surpasses this in transparency. In the baths or reservoirs it never deposits the smallest trace of sediment, nor does it acquire any disagreeable smell. It is all but tasteless; smell it has none: "yet," says Dr. G., "on entering the deep caverns of the two principal sources, I was sensible of a certain peculiar odour, not unlike that which a hard-boiled *fresh and sweet egg* gives out when the shell is removed. By testing and analysis, Chemistry has detected no fewer than twelve distinct saline ingredients in this nearly insipid water; these altogether amount to three grains in the pint, and of these the glauber salt makes up the largest proportion. It is chiefly

employed in baths, but inhalation of its steam into the throat and lungs is considered wonderfully curative in cases of incipient consumption. Dr. G. adds an ample catalogue of formidable maladies in the treatment of which he is confident the Gastein baths, judiciously and sufficiently used, will not disappoint the patient. With a view to unriddle the mystery of thermality in mineral waters, he risks a repetition of the ancient conjecture, that the heat developed in hot springs is of volcanic origin.

Hof-Gastein possesses no mineral springs of its own; it receives its thermal water from Gastein in wooden pipes, which retain more heat in the passing fluid than is required for the purpose of bathing. The former is a considerable village in a plain, within sight of the latter place, where want of room for visitors gave rise to the reputation of this as a watering-place. Many people, after trying the mountain air at the fountain-head, come down to Hof-Gastein for a change of climate, and find the baths here equally efficacious.

Dr. Granville finishes the description of his "second geographical group" with an account of adventures, observations, and reflections, as they occurred on his journey to the Bohemian Spas, and on excursions into various parts of the intervening country, including his visit to the salt-mines at Hallein, and its dark subterranean lake of brine. When exploring the cavern of a thermal spring at Gastein, he collected some of the *schlegm* or slime which adheres to the rocks around the source itself, where no day-light penetrates; he culled some specimens, also, of the slender stalactitious depositions which hang from the same rocks, and some of the green, grassy, slippery *conferva thermalis*, found at the bottom of the channel in which the hot water flows. On his return to Saltzburg he presented these curiosities to Dr. Werneck, for examination with his microscopes, one of which is said to possess extraordinary power and distinctness. The schlegm is a loose, fungoid, ropy deposit, formed in the dark recesses of the hot springs, where no sun-light ever enters. Its colour is sometimes white, sometimes brown; it is not of animal origin, but of a vegetable and cryptogamic nature. When a minute portion of it is diluted on the object-glass, it exhibits several pear-shaped capsules, standing in groups upon a "slimy, felty pericarp, formed of succional vessels," which are the real receptacles of the seed. The thermal conferva is never found in hot mineral waters where light has no access: it vegetates on the bottom of rills outside the caverns, and in open reservoirs, wherever rough bodies or obstacles to the water's course enable it to attach itself. This conferve might be compared to a green silk plush, the hair of which has been pressed and smoothed down in one uniform direction. Two classes of beings endowed with motion, and of striking and many-varied forms, are distinguishable, in the smallest piece of this substance, by the microscope. Some of these are vegetable, others animal, infusorial animalcules: the latter find food and nest in the former, which alone gives its green colour to the conferval production. While under observation, some of them were seen oscillating from

side to side, like a pendulum; others were rearing one of their extremities from the prostrate to the vertical posture; and other gigantic bino-gastric creatures, disentangling themselves from the trammels of many green fibres, advance majestically with an extraordinary figure, and devour most gluttonously the *monas*, the *atomus*, the *guttula*, and numberless other matters, as they appear in succession. Whenever the smallest imaginable portion of the stalactitious *tubuli* is broken into powder, and subjected to the microscope, it is shown to consist of most beautiful and delicate crystals, distinctly defined; its ultimate molecules appeared, to Dr. G.'s eye, to be endowed with movement. Neither of the experimenting Doctors seem to have conceived the idea that the *Confervæ thermales* vegetating externally to the cavern, might be the pear-shaped capsules of the *schlegm*, with their felty pericarps, vegetating in ill-aired darkness within it, but farther developed under the genial action of light and the atmospheric air.

Carlsbad is "King of the Mineral Springs." Dr. Granville places it at the head of his seven Bohemian Spas, forming a "third geographical group," which, besides their king, includes those of Marienbad, Egra, Pullner, Seidschutz, Seidlitz, and Toeplitz, each with its peculiar excellencies and attractions.

Sprudel, the *brudel*, or bubbler, of Carlsbad, is the chief of seven streams that burst through a calcareous crust, and launch on high a column of hot water, which, in descending, assumes the semblance of a liquid weeping-willow. At a very early hour of morning—when, in these unsophisticated retreats of invalids, all the world is up and stirring—the Doctor hurried to "that most extraordinary phenomenon of Nature," with all the impatience of one who is eager to satisfy himself, by ocular demonstration, of the truth of what seemed almost fabulous in description. Nevertheless, at the sight of that celebrated fountain, to which the curling vapours that hovered over its colonnaded temple directed him without a guide or a question, he felt that all the descriptions he had read of it had failed to convey the impression he experienced. The sudden view of the violent, lofty, constant, and prodigal out-pourings of hot water from the bowels of the earth, foaming in the midst of its clouds of vapour, within forty-five degrees of the boiling point, on the very margin of the Teple, a cold, placid, and sluggish stream—this sudden view rivetted him to the spot for a brief period. Although pressed on all sides by the increasing throng of water-drinkers, he felt himself alone, absorbed by this striking object. He stood contemplating it for some minutes, foolishly imagining that the next moment would reveal the secret of this natural magic. But the crowd of eager invalids who surrounded it, keeping at a respectful distance from its scorching spray, seemed to look for health in the spring, without ever thinking, as he did, of the two great agents combined—heat and water, with a sprinkling of soda—from which they were to obtain it. Monologizing gravely, he asks himself, "What is it that imparts to this mysterious current that violent im-

pulse which makes it spring from the bosom of the earth with an upright jet of eight or nine feet of elevation, from the aperture in the rocky crust underneath the building raised over it?" A central fire, is the solemn response. The Sprudel, then, is the ardent offspring of an unquiet and relentless agent, which fills the atmosphere with hot vapours, and impetuously over-runs all the bounds whereby art has vainly attempted to restrain its endless throes. The size, height, and appearance of its jettings is for ever varying; and in its upward and downward course it is accompanied by a noise combining that of the splashing of a *falling* cataract and of the boiling of a vast cauldron of water—a noise which, like the stream of water it accompanies, has ceaselessly continued for numberless centuries—a noise which, in times of darkness and superstition, would have induced man to fall prostrate, offering to its cryptic cause the homage of his amazement and adoration.

One pint of the Carlsbad thermal water contains 31½ grains of solid saline substances, and a large proportion of these consists of glauber and common salt, with carbonate of soda, and traces of iron and iodine: its aëriform fluids are said to be carbonic acid gas and sulphuretted hydrogen, but this last is doubtful. It emerges from its source at 170°, F., of temperature. This water emits an *animal* smell; its first taste is saltish, its after-taste becomes alkaline. The Sprudel spring is useful in some classes of complaints; it dissipates adhesions; but "it is the despondent, dejected, misanthropic, fidgety, pusillanimous, irritable, outrageous, morose, sulky, weak-minded, whimsical, and often despairing hypochondriac—made so by continued indigestion, by obstinate and unremitting gout, by affections of the nerves of sympathy and of the gastric region, and by other equally active causes—that Carlsbad seems pre-eminently to favour." The companion of Dr. G.'s two sons drank of all the springs; he attacked the Sprudel at once, and in quantities of several goblets, and the condition of the system which followed was always one of comfort.

Great must be the delight derived by the philanthropic spirit from meditation on a scene of the Sprudel at the balmy hour of morn, so favourable to the creations of ideality and devotion. By Dr. Granville a scene of this sort and the scenery are thus depictured:—

"The eagerness with which the different people of Carlsbad, of both sexes, rush towards the Sprudel at six o'clock in the morning, to partake of its salutary waters, is an interesting sight. In its appearance the motley throng is quite theatrical, and the many-shaped and many-coloured costumes worn by them form a living illustration of geography. The multitudinous faces of which that throng consists—their divers modes of drinking the hot mineral fluid—the various effects produced by it on their countenances—the accumulation of individual cases of disease concentrated under one roof, among which the eye of the medical man detects not a few disorders that are cankering their victims—all these things I saw and felt at my first visit. The company assembled was very numerous: the colonnade in front of the source was full. The restless multitude moved to and fro in every part and in every direction of that covered promenade, which runs between a narrow

parterre of flowers on the one side and the sluggish and dirty Teple on the other. As early as five o'clock in the morning, the little nymphs of the Sprudel—smart, lively young lasses—are in attendance to distribute, with critical impartiality, the bounty of their spring. They are all dressed alike, in green dresses in the morning, and in light-coloured robes in the evening. Standing at a little distance from the boiling jet, and holding in their hands a stick, four feet long, with a cup-holder fastened to one end of it, these damsels extend the latter towards any one whom they see approaching with his beaker, receive it in their cup-holder, and plunge it within the smoking column of water. From this it is immediately withdrawn quite full, and presented to the same individual again, who, with what relish he may, disposes of its contents."

Falling into a philosophising mood, Dr. G. instituted an admirable experiment, in the centre of a square and lofty pavillion where the Sprudel rises. Thus, by means of accurate and diversified observations, he ascertained that there were some of the sickly who sipped with pigeon-sips the salutary elixir, giving only a gentle shudder as they drank it; and these were ladies: there were others who, more adventurous, swallowed half a beakerful at once, with only a slight pursing up of the lips, and looked round for approbation; and these were *esprits forts*, the Sprudelian dandies: my Lord A. and Sir J. L. looked grim when disposing of their dose, and declared it had no taste: one who thought himself unseen, was detected in bringing slily out of his large *beniche* a lump of sugar, which he kept in his left hand ready to pop into his mouth the moment his beaker had quitted it; and he was one of the subjects of Mahmoud who had not yet exchanged the turban for the ugly and tasselled red cap: another who had just received his beakerful of the Sprudel from the fair hand of a green-mantled maiden who eyed him with a malicious meaning, retired quickly into a corner, and, turning his face to the wall, swallowed in secret the noxious draught; and he was a Polish Jew, his dress betrayed him. In this manner the doctor watched the ever-varying modifications of the human countenance as they were produced by the influence of one and the same agent; and from these observations, constituting clear principles, he arrived at the conclusion that men are but overgrown babies.

Without exception, every one of the Carlsbad thermal springs deposits a large quantity of calcareous matter, which forms stalactitious concretions; and as these depositions take place abundantly before the very eyes of those who attend daily to drink the water, many of them have been deterred from continuing its use, under an apprehension that similar incrustations might take place in the bowels or on the teeth. Dr. G., however, shows that this prejudice has often been combated by superior reasoning; and he adds the reason which satisfied himself that, from drinking at the thermal sources of Carlsbad, none need be apprehensive of having an intestinal concretion.

Dr. Granville wisely takes Professor Ehrenberg, of Berlin, for

his guide, when retailing microscopical observations on the animalcules of hot mineral springs. The Professor has adopted a curious and novel view of this subject, which he has minutely and repeatedly examined. He made experiments upon specimens sent to him from the thermal sources of Carlsbad, and he contends that living fossil infusoria exist in the water. In the peat-bog of Franzenbad and the meadow-earth of Billin, he discovered the same kind of animalcules. In all these specimens he detected eighteen different species of moving fossil bodies, belonging to the family of *Bacillariæ*, which have hitherto been considered as forms of plants by practical naturalists. Professor Ehrenberg has published figures of these moving fossil bodies, and he assigns several powerful reasons for believing them to be *fossil animalcules*. It is his opinion that these creatures are constantly reproduced, and form many of those stratifications of the earth's surface which have hitherto been looked upon as the remains of extinct series of marine animals, left after great geological commotions. He enters upon a curious calculation of the number of such animalcules required to make up a given quantity of the fossil stratifications. He is firmly persuaded that these animalcules are generated every moment; that after their death they form entire rocks; and that, therefore, they ought to be taken into consideration by those who endeavour to explain the structure of the globe. He makes the marvellous statement that twenty-three millions of such animalcules would make up a cubic line of the rock, and actually be contained in it. Now, as there are 1728 cubic lines in a cubic inch, the latter would then comprize nearly forty billions of the animals, the siliceous body of which must weigh about $\frac{1}{187}$ millionth part of a grain: and as to the size of these living beings under a fossil shell, the Professor has ascertained it to be just one-sixth of the thickness of a human hair.

Dr. G's. sketches of Carlsbad are various and elaborate, and his information concerning the place and its people is altogether very multifarious and exceedingly instructive. It is replete with sagacious remarks and scientific inductions, enlivened with frequent fine touches of the gastronomic philosophy: these last are always exquisitely brilliant and tasteful. One remark of his merits the consideration of all true philanthropists and moralists. He understood that this Spa had been deserted by the vicious and the mere lounger, and was become a real retreat for invalids; and he also understood that this happy change was effected by creating for such fribblers the disappointment of finding little fun there and still less to eat, with the absence of gambling and the non-existence of more private iniquities. With respect to diet at Carlsbad, there is a medico-sprudelian dish, which once was, and still ought to be, in great vogue with invalids and other visiters. By throwing a little butter, flour, and salt, and the yolk of an egg, with slices of bread, into a proper quantity of the hot mineral water, the thrifty housekeepers cook you up a soup in the twinkling of an eye. This is distinguished by the expressive ap-

pellation of *Sprudel soup*, and verily it must be equally delicious and salutary. It is the duty of genuine patriots to bring the mess under the notice of temperance societies.

Impressed with a due sense of the hospitality and comfort he experienced at the "King of the Spas," the complaisant Doctor breathed a grateful aspiration for its prosperity as he set out on his journey for Marienbad, whose salutiferous sources were first made known to Europe about the beginning of the present century. Although this is a watering-place but "of the other day," yet it already vies with the principal Spas of Germany for the beauty of situation and embellishments, the great affluence of strangers to it from all parts, and the tried efficacy of its springs. At a distance the place exhibits the semblance of an immense garden; as the traveller approaches it his first impression is quite delightful. Dr. G. stopped for a few minutes to enjoy its contemplation, and he styled it the "Garden Spa of Bohemia," which has some pleasant distractions, but is not rich in artificial amusements. In his peregrination to the "Temple of Health" he was seeking, the Doctor met herds of very small cows, tended by fine, healthy-looking peasants. These animals resemble the Welsh ones, but they have a far prettier head, and prettier limbs; their coat is of a uniform rich brown tint, sleek and shiny. Both men and maidens were seen walking barefooted, although he was within a few minutes of an assemblage of gentle blood, crowded in gay saloons, or dispersed through groves and gladsome promenades.

Marienbad and the regions around it afford prospects of the loveliest nature imaginable. Here, too, you expand your lungs with freedom and elasticity: the air is light, pure, ethereal. After a summer's shower, the renewed freshness of the atmosphere carries on its wings a balmy fragrance from the surrounding forests; and the deeper green with which the white Grecian-and-Roman-looking houses of this lovely place are intermingled in profusion, adds to the beauty of the scene, and almost converts it into one of enchantment. This of itself, Dr. G. feels convinced, would cure many of those vile stomach disorders which the London doctors strive in vain to remedy with that eternal and never-varying *blue* pill and its *sable* follower, with their *golden* creations.

All the Marienbad waters are cold, and their sources are found on flat ground; some of them exude from peat or a marshy soil, others from fissures in the granite. They are all accompanied with more or less of free carbonic acid gas, and this imparts to them a tartness which disguises their natural saline taste. At their first issue they are transparent, but afterwards become turbid, and deposit a yellow-ochry sediment. Immediately after being drank they feel cold to the stomach, and the gas rises into the head as after drinking a glass of champagne. These springs are of two kinds, saline-alkaline and alkaline-chalybeate; the latter produces tonic, the former has aperient effects, and they both operate in nearly the same way as the same kinds of water, having the same strength, are used to do at other places.

The resident doctor lauds the Kreutzbrunnen to the skies, and looks upon it as a panacea in all chronic affections, particularly those of the digestive organs. It is his oracle, and the affection he bears it is almost romantic; a clear proof that the worthy man is not without a failing of his fellows—the weakness of waddling on hobbies. This spring, says Dr. G., is his *maitresse*, although he is aware that, at the other Brunnens, the principal physicians bear an equally ardent and undivided love to the object of their adoration. When a glass of the Kreutzbrunnen is drank cold, the water feels uncomfortable to the stomach, but walking removes that sensation. Its taste is pleasant and *piquant*. When mixed with an equal quantity of the same water, treated so as to give the mixture 90°, F., of temperature, the taste then is exactly like that of veal broth clear of fat and with a little salt in it—very pleasant. When its heat is raised to that of the Sprudel, at Carlsbad, the water loses its agreeable *gout de bouillon*, and acquires a stronger, more sapid, more saltish taste, somewhat astringent. Great emission of the gas, or eructations, follows a draught of this spring; but the head remains undisturbed, and the digestive organs still. Taken thus it is an invaluable remedy in all bilious complaints, without requiring the least assistance from mercury. The addition of warm to the cold mineral water instantly destroys its limpidity, and gives it a gruelly appearance.

Adding descriptive observations on the properties of this and the other springs of Marienbad, on its gas-baths, its topography, society, and scenery, Dr. Granville concludes with the remark that, with all its advantages and amusements, Marienbad is not a Spa of pleasure. It is a lovely and enchanting retreat for invalids, which offers to suffering humanity, in a sequestered valley, a safe, certain, and prodigal source of relief, away from the bustle and din of cities, as if Nature pointed out to us that health is best obtained in seclusion.

Franzenbad is the Spa of Egra, and it has two important springs—the Franzenquelle and the Salzequelle, whose properties coincide greatly with those of the waters of Marienbad, from which they also differ very little in temperature. According to Dr. G., there is a notable difference in the physical effect produced by each of these springs on the constitution; both are equally active as deobstruents, and both are digested with equal ease. But while the *first*, containing a larger proportion of iron, stimulates and excites during its operation, and is therefore inadmissible in cases of great irritability and fulness of blood, the *second* cools and tranquillizes, is less stimulating, and purifies without disturbance of the nervous system.

This place also has an extensive establishment for mud-baths, and these are represented as being specific and infallible in cases of excessive debility and prostration, particularly in paralysis of which gout has been the cause. Dr. G. testifies that the stuff used for making one of these baths is an agent possessing infinite, almost dangerous, power. It is quarried in an adjacent field, by means of spades. He saw a layer of it nearly twenty feet deep, immediately below the turf,

lying upon a bed of sand. The mass looked moist, and had an intense as well as most beautiful jet-black colour. Throughout it are found some curiously stratified thin plates of iron pyrites; some of these are nearly a foot square, and upon one surface only, the other being smooth, they have depositions resembling fossil plants of the Reed and Broom genus, in high relief: the whole is very hard and difficult of fracture. These masses are found, at all depths, in the stratum of the peat or bog-earth, and at various angles of the horizon. After exposure to the air for a few days their upper surface appears covered with a yellowish-green efflorescence, which, when tasted, imparts to the tongue the sharp sensation produced by sulphuric acid; its smell also resembles that of the sulphurous acid gas. When tested with litmus-paper, the colour of this substance is instantly and deeply reddened. This bog-earth, being brought to the bathing establishment, is thrown into two very large wooden vats standing under cover, at the height of four feet from the ground; and the earth being diluted there with mineral water, steam is made to pass through the mixture, which is stirred up constantly, until a proper degree of heat as well as consistency is obtained. Each bathing-tap being then pushed under one of the vats, the contents of this are allowed to escape through an opening until the tub is nearly filled, when it is wheeled into an apartment and used. At first the temperature is very high, but it is allowed to cool down to 80°, F., the degree of heat at which the mud-bath may be taken without causing excessive irritation. This kind of bath has the consistence and appearance of a semi-fluid poultice of bread-crumb coloured with the blackest ink; and it exhales a smell not unlike that of pyroligneous acid, the taste of which, also, is retained for many hours by the bather's skin. On coming out of the bath, and having the mud washed off with warm mineral water, the surface of the body feels soft, and looks almost like satin.

The mud-baths of Franzenbad increase the action of the skin, are solvent as well as emollient, and stimulate the nervous system. These effects are attributed to four principal elements found in the composition of the bath—the fatty and peaty matter, the caloric, a highly volatile substance, and the metallic and saline ingredients. When the mud is thrown away it soon exhibits superficial strata of sulphate of iron and Glauber salt, with a large quantity of free sulphuric acid.

So profusely is gas distributed about Franzenbad that one may see it, feel it, and disengage it, in every part of the town and country. There are gas-baths at this place, and these have their supplies from the gas which issues through a tube plunged into the ground within the establishment, at the rate of five thousand seven hundred and sixty cubic feet in an hour. After repeated trials, it is regarded as being nearly pure carbonic acid gas, and its application in the form of a bath has been attended with beneficial results.

Dr. Granville deals very compendiously with the Spas of Pullna, Seidschutz, and Seidlitz. The first is a miserable-looking village,

and its waters are bitter; the second lies in a plain, and its water, though intensely bitter, is an effectual purgative; and who has not become acquainted with the name of Seidlitz, through its gentle and pleasing aperient salt? which, in fact, the Doctor says, has nothing in common with the chemical component parts of the genuine Seidlitz water of Bohemia, except the name. These three springs have the temperature of 58°, F., at all seasons; but no patient frequents them, because the locality would be unfavourable for the establishment of a watering-place.

Toeplitz is a gayish place, and it occupies a situation partly on the patrimony of the Prince de Clary, in the midst of a rich country smiling all around with Nature's bountiful gifts. Placed outside the bath-houses, a monumental stone records the traditionary story of the first discovery of its hot mineral springs. Here, as Dr. G. gives it, it was not a stag or a dog falling into the *scorching* stream, which by its (the stream's) cries called the attention of man to the existence of a new blessing; but they were pigs which, having fallen into *hot* water before their time, proclaimed by their grunting the existence of what has given Toeplitz a celebrity of eleven centuries, and a seniority over every other mineral Spa of Germany. This place has long been the venerable resort of the high-born and the humble, the hale and the unhealthy. The influx of invalids to its springs is numerous and brilliant; its baths, both private and public, are excellent; its comforts and embellishments are worthy the patronage of crowned heads; and the living at Toeplitz is beyond comparison, Dr. G. declares, cheaper than in any other watering-place he had visited. Its waters are thermal, and the hottest of them emerges from a crevice in a rock of porphyry. Their specific virtue lies in their power of restoring the cripple to perfect motion and elasticity. Altogether they are nearly as good for every useful purpose as those of the Beulah Spa or the springs of Strathpeffer; so that for this and the other reasons it may be usefully frequented by the "travelled invalid," for whose benefit Dr. G. consigns to his pages the faithful and facetious observations wherewith he completes his last "geographical group" but one, and the last is made up of the Bavarian and Nassau Spas, which are those of Liebenstein, Kissingen, Bocklett, Bruckenau, Hombourg, Soden, Seltzer, Geilnau and Fachingen, Schlangenbad, Schwalbach, Wiesbaden, and Ems. Dr. Granville's narrative of his pilgrimages to and around these respectable places is, as usual, exceedingly varied and animated. Two only of their Spas are thermal; the rest have a low temperature, and possess but a moderate impregnation of saline ingredients. They produce effects on the persons who employ them, internally or externally, not very much different from those caused by the same kinds of mineral waters in France, England, and Italy, when similarly used in diseases and circumstances not essentially dissimilar. Altogether, his pictures of this last "geographical group" are as happy and as graphic as those which impart their characteristic features

to his previous labours; and, indeed, there is a generous wisdom, significant of extensive experience, in the accumulation of particulars enumerated by him as requisite for the guidance of "travelled invalids" as they hasten from home in the hope of being "rejoiced that they had exchanged art for nature" and for health at the Spas of Germany.

Dr. Granville's volumes have a very handsome appearance, and are sufficiently well adapted to allure the admiration of a fashionable patronage with its desirable results. His prints are neatly executed, his pages are printed with a clearness that will ensure comfort in their perusal, and the purity of his philological attainments is exemplified most beautifully in the liberal discretion wherewith he selects the finest French phrases, and applies them as a remedy for the natural sterility and harshness of our vulgar English tongue. May he long enjoy the recompense of his meritorious exertions!

Excursions through the Highlands and Isles of Scotland in 1835 *and* 1836. By the Rev. C. Lesingham Smith, M.A., Fellow, and late Mathematical Lecturer, of Christ's College, Cambridge.—London: Simpkin & Co. 1837. Small 8vo., pp. 310.

ALTHOUGH much has been written on the Highlands, by travellers of various dispositions and capabilities, the subject is by no means exhausted, nor, indeed, we suspect, will it ever be. Besides the ever-interesting scenery and other attractions of the Highlands, the intelligent tourist must find, at almost every step, some things which had previously remained unrecorded, and many others which had been erroneously or partially represented. One of the main objects of such works as Mr. Smith's is to amuse as well as instruct, and if the author succeeds in either of these particulars he has assuredly no right to complain.

Mr. Lesingham Smith is a very pleasant fellow-traveller, and although we were not in his company above a few months, yet we learnt enough of him to discover that he is a very intelligent man, and that his veracity may, in every respect, be relied on. He is an enthusiastic admirer of the Highlands, praising not only the scenery —which all travellers unite in lauding—but also the natives, being highly delighted with their hospitality and simplicity. With regard to this, we ought to observe that our author is one of those individuals who is always at peace with himself and every one else; he makes due allowances for the faults of others, adapts himself to all tempers, and never picks a quarrel with a person who, notwithstanding a little constitutional warmth of temper, may, if courteously treated, become one of his best friends. Mr. Lessingham Smith is, in fact, exactly fitted for making his way in the world. He would find no difficulty in introducing himself into any circles, and, when known, would be sure to be respected.

Now it is curious to observe what different accounts two travellers

will give of the same country; in many cases not so much from wilful misrepresentation as from the difference in their own *cerebral organization*. The one will blame every thing and every body, while the other, falling into the opposite extreme, will see precisely the same persons and things in a favourable point of view. Of course the latter state of feeling is beyond comparison the more enviable, and, if into either, into this latter extreme is our traveller often disposed to fall. It cannot be denied that the Highlanders abound in that true politeness springing from benevolence, and though rough in exterior, they are certainly far from wanting in the gentler and nobler faculties of human nature. But, at the same time, we are occasionally inclined to suspect that the reverend tourist's affability may have led him to overlook many faults, both in men and country, and also that his mild deportment may have induced others to conduct themselves more courteously and hospitably towards him than might otherwise have been the case. Be this, however, as it may, the volume, which has afforded us considerable amusement in the perusal, may be considered, on the whole, as forming a correct portraiture of the Highlands. The style is engaging, and the manner of description such as will be calculated to interest all classes of readers. The book appears to consist of notes taken at the end of each day, of course retouched prior to publication.

Previous to presenting our extracts, we must notice one blemish which ought not to be overlooked. It is the misplacement of the commas in numerous places, frequently wholly subverting the sense or turning the passage into nonsense. We would fain have believed that the fault was chargeable to the "printer's devil," but the circumstance occurs far too often to admit of its being accounted for in that way.

The following quotation, though not relating to the Highlands, will interest our readers. Our author is writing at the Argyle Arms, Inverary.

"In the evening I found the coffee-room filled with a very noisy set of people—'bit Glasgow bodies, awa' on a pleasurin' tour.' There was one solitary man with a weather-stained countenance, who, when I took my seat near him, addressed a few ordinary words to me. I was soon after called away to another table, where tea was placed for me, and the weather-beaten man was again left alone. He seemed so utterly abandoned by his kind, that I could not refrain from speaking to him again; on which he immediately drew his chair to my table, seeming delighted to have a human being to associate with. He said he was just returned from Canada, where he had been residing for the last four years. The Government he described as being in a very unsettled state, on account of the animosity existing between the English and French population. In their House of Assembly some of the speeches are delivered in French and some in English. He resided within gun-shot of the American frontier, and spoke in no very measured terms of the American character. It is a frequent practice with them, he says, to get into debt upon the Canada side, and then step over the frontier and defy their creditors. Mrs. Trollope's book is very little exaggerated, for they have no manners and no feeling. They speak of attending an execution as 'taking a day's pleasure!' They are utterly selfish, even within the pale of

their own family; and when the cholera raged there, many deserted their own parents and brethren. This disease was so destructive that churchyards were covered with dead bodies, for which neither coffins nor graves could be provided. A friend of his was tossed with other carcasses into the general heap, and quicklime was actually strewn over the whole, the poor man being perfectly conscious all the while, but unable to stir: at last he contrived to crawl out, and is now alive and well. Many persons were buried in this horrid and premature way, for the Americans never keep any body for more than a day—a man being good for nothing when he is dead. He told a singular story of three Irishmen, who were seized with cholera when perfectly intoxicated, and were carried in a cart to the sheds erected outside the town for the reception of the sick. The surgeon, who was exhausted with his day's work, said he should not attend to men who had no respect for their own lives; and so having administered medicines to the other patients, he left the Irishmen to their fate. When he returned in the morning, all were dead except the neglected Paddies, who, on seeing the doctor, immediately exclaimed, 'When will your honour be ordering us a drop of drink?' One of the victims of this pestilence was Brandt, the chief of the Huron tribe: he was a fine young man, much beloved by his people, a captain in the English service, and a descendant of that General Johnson who had such great influence with the Indians. He died as much from drinking as from cholera; and it seems that this fatal habit is destroying numbers of the red people.—My new acquaintance stated, that, on arriving at Glasgow, he wished to see three of his friends, who were living there when he left Scotland; but on enquiring he found that they were all under the sod."—p. 15.

Mr. Lesingham Smith is a great stickler for the superiority of the service of the church of England. He does not, however, once hint that that service admits of very considerable improvement. Nor, indeed, is it perhaps to be expected at present that a minister of our church should be desirous of effecting the alterations and abridgments to which we allude. After describing the service of the Presbyterian church of Scotland, he says:—

"Such is the service of the Presbyterian kirk of Scotland. I went to hear it with a predetermination that I would not allow myself to judge hastily or harshly; yet my firm conviction is, that in no single respect whatever can it bear a comparison with the service of the church of England."—p. 19.

The following quotation is amusing. Our tourist is paying off one of his guides, and observes—

"'Here's sixpence a-piece for yourself, and wife, and seven bairns, and sixpence over for *luck*.'

"If I had given him a thousand pounds he could not have been more surprised or more grateful. He looked at the two half-crowns for some time without uttering a word, and then burst out:

"'Ye're a gentleman; a rale gentleman! Give us your hand! I'll be up to carry your luggage the morning for nothing. Thank ye—thank ye kindly.'

"And then, as I turned away towards the inn, he slapped me on the shoulder, and once more exclaimed 'ye're a gentleman!' with a marked emphasis on the word, as if it embodied the highest compliment which one man could pay to another. And the Gael was so far right; but whether giving him a crown proved me to be a gentleman is another matter: I know those who will rather think it proved me to be a fool."—p. 169.

"July 31.—This morning I made a point of attending the Presbyterian service in the choir of the cathedral [at Glasgow]: it differs in no respect from the service of the humblest chapel. The contrast between the simplicity of their religious forms and the splendour of the edifice in which they were assembled was by no means agreeable. O! how I longed to hear the sacred tones of our own majestic organ, and the rich melody of our choristers instead of the meagre notes of one poor clerk and the accompaniment of an unmusical congregation."—p. 180.

Although the outward forms observed in our cathedrals, the absence of which is above regretted, may have an imposing appearance, it may well be questioned how far they tend to inspire devotion in the hearts of the congregation. As regards the sublime harmony of the organ, and the "rich melody of the choristers," we can fully chime in with our author. Music is an important and indispensable part of divine service; but to allow an old drowsy clerk—and what clerks who sing solos in churches are not old and drowsy?—to snarl a psalm-tune through his nose, with the congregation following in his wake (the blind leading the blind!), is in our opinion, both ludicrous and impious.

The journal continues as follows:—

"Another thing which offended my English prejudices especially, was that the men walked into the cathedral with their hats on, and never took them off till they had reached their pews. The moment too that the blessing was ended on went the hats again; as if the place were only sacred while the voice of the pastor echoed along the aisles.

"In the afternoon I went to hear Dr. Wardlaw; his sermon was written and very excellent. What a contrast to the tautological, disjointed harangue of the morning! He belongs not to the kirk of Scotland, but differs, I believe, only in forms, not at all in doctrine. I observed two circumstances in which there was a departure from the rules of the national kirk. The first was, that the congregation stood up to sing, instead of keeping their seats; the second, and much the most important, that a chapter from the Old Testament, and another from the New, were read before the sermon commenced."—p. 181.

The following extract, and especially the sentence we have marked in italics, is a pleasing proof of Mr. L. Smith's enthusiastic admiration of fine scenery:—

"It was the morning of Sunday; but there being no kirk nearer than four miles, and no road to this one except over peat mosses, I resolved to walk to Scourie. The distance is fourteen miles: rather more, perhaps, than a sabbath's journey. But the most rigid disciplinarian would hardly have blamed me for endeavouring to deliver myself from the captivity of Rhiconich.

"It rained, of course; and the clouds were as condescending as ever, stooping far below the summits of the mountains. At one point, however, there was a momentary clearing, and what a glorious landscape did the rising mist unfold! *One glance at such a scene is worth a whole week of sunshine!* A stupendous amphitheatre of mountains surrounded me, where crag frowned over crag and rock was piled on rock, and where the sloping faces of the loftier hills were scored and wrinkled by the channels of ten thousand torrents. More conspicuous than all, the huge geometric cone of the stack arose, the

lingering clouds still rolling fantastically about its dim and spiry peak. Below me, in a vast hollow, lay the dark surface of a loch, dotted with numbers of stony isles, whose grey rocks and blossoming heather stood in beautiful relief over the smooth murkiness of the water."—p. 301.

After noting the joyful appearance of animated nature one clear calm day in September, our author makes the following appropriate reflections, which may serve as a hint to those who would introduce *bills to enforce the better observance of the Sabbath.*

"I never witness a scene like this without wondering at and pitying those gloomy religionists who imagine they do God service by rejecting the blessings which he has spread before them. When I perceive all the inferior animals of creation so busy and so gay, I can never believe that man, the lord of all, will be accounted guilty when joyous, and that he is profitable only when self-tormented; or that he will advance his interests hereafter in proportion as he steels his heart against the sympathies which gladden this life and disregards those prudential cares which may alleviate or remove its ills. Virtue is not only consistent with cheerfulness, but rarely approaches perfection without it; and he best serves his God who provides as largely as he can for his own rational happiness and that of all his fellow creatures."—p. 304.

We shall now present our last extract, for the very good reason that we have got to the end of the book. The journal closes with the ensuing paragraphs, which may be taken as a kind of summary of our author's opinion of the Highlands.

"Throughout this whole excursion I have been singularly unfortunate in weather; owing partly to the late period of my visit, but principally to the extraordinary nature of the season. Yet in spite of circumstances so adverse to enjoyment, and of the consequent solitariness of my rambles, I have derived from them no inconsiderable share of pleasure, information, and health.

"In the Highlands a stormy sky is seldom without its peculiar charms: it throws down upon the wild landscape contrasted light and shade, magnifies objects which are already intrinsically vast, and exhibits the face of Nature in alternate majesty and grace. And when at last the sun shines out with steadfast splendour, its cheering ray seems to light up the innermost chambers of the heart, dispelling all fears and anxieties, and fully reconciling us once more to our position on the globe. We then feel mere animal existence to be a blessing; and in the actual enjoyment of the present hour, cease for a while to hope for the future.

"But whether I met with bright or stormy skies, I never roamed far without encountering scenes of surpassing beauty or of startling grandeur. And sure am I that whoever wanders through this romantic land, will find whatever of poetry or of philosophy his mind may possess awakened and stirred within him. My path, too, was always cheered by the reflection that I was among a race of men who had forgotten the ferocity, but not the hospitality, of their forefathers, and whose urbanity to the stranger called forth my warmest sympathies, and raised in my estimation the standard of humanity. No one could have come among them with less claim to kindness than I had; and no one, surely, could have met with more. I have not set down the half of it; and could still recount many an instance of good will for which I cannot hope to make any return: for, in all human probability, I shall never meet those kind-hearted Highlanders again, and never more loiter among their beautiful glens. All that now lies in my power is to acknowledge my obligations; especially to one worthy family from whom I

experienced the Arab's hospitality and the Samaritan's compassion: and if ever this humble volume should reach a corner of the kingdom so remote as Durness, it is a pleasure to me to reflect that its minister will find the last sentiment recorded here is that of gratitude to him and his, for their generous treatment of a weary stranger."—p. 310.

The volume is adorned with several highly creditable sketches of Highland scenery, &c., apparently from drawings by the author, lithographed by the well-known artists, Messrs. Day and Haghe. We should not be surprised or displeased to find that our notice of Mr. Lesingham Smith's *Journal of a Ramble in Scotland* has caused some of our readers to make themselves further acquainted with its contents, by a perusal of the whole book.

Journal of a Horticultural Tour through Germany, Belgium, and part of France, in the Autumn of 1835; to which is added a Catalogue of the *Cacteæ* in the gardens of Woburn Abbey. By James Forbes, A.L.S., &c. London: Ridgway & Sons. 1837. 8vo., pp. 164.

"THE continental gardens and botanical collections having been rarely visited by the British gardener, his Grace the Duke of Bedford, with his usual anxiety for the promotion of useful knowledge, very liberally and kindly proposed, in the autumn of 1835, that I should undertake a horticultural tour through several parts of Germany, Belgium, and France, with a view of inspecting the different collections and productions cultivated in some of the most celebrated horticultural establishments in these countries." —*Preface*, p. v.

Mr. Forbes accordingly travelled, took his notes, and published them; and as the author is an intelligent man, and evidently tells us his real opinion of what he saw, his observations are both readable and useful. We are, moreover, glad that our author has not considered it beneath his dignity to make a few remarks occasionally on paintings, statues, &c., which proves him to be possessed of a mind both more enlarged and more cultivated than the majority of even head gardeners. Without further noticing the contents of this volume, we shall extract the following conclusions, at which the author has arrived on the objects of his tour.

"Upon the whole, in regard to the general state of Horticulture in the countries which I visited, the following conclusion must be drawn:—The plants in the hot-houses are in most of the establishments kept in excellent order and in a healthy state; the *Succulents* also appeared to be much more extensively cultivated than they have hitherto been in England. But the general order and neatness of the grounds (with only a very few exceptions) were but little attended to. Nor did the gardeners appear to me to well understand the forcing of fruits, except in one or two places in France; neither did I perceive that nicety in the training of fruit trees that is thought indispensable in England. Vegetables are, however, in large establishments, more extensively grown; but there certainly did not appear to be such a general spirit for horticultural improvment as is prevailing in this country. At no period was gardening pursued with greater spirit in England than at

this moment; insomuch that we can scarcely visit a nobleman or gentleman's gardens without observing very extensive improvements and alterations proceeding in every direction. And this we cannot but regard as an indication of application and attachment to rural improvements highly honourable to our nobility and gentry, as superseding many of those pursuits that used to prevail to a great extent with gentlemen residing in the country, which had but little tendency to the improvement of their grounds or estates."—p. 145.

We have only to add that another nobleman has followed the excellent example of the Duke of Bedford, in sending out his gardener to foreign parts on a horticultural tour; and that we hope to see the plan, ere long, extensively adopted.

Account of the late Aëronautical expedition from London to Weilburg, accomplished by Robert Hollond, Esq., Monck Mason, Esq., and Charles Green, Aëronaut. London, 1836. 8vo., pp. 52.

Mr. Monck Mason inscribes his account, in testimony of sincere regard and friendship, to Robert Hollond, his fellow-voyager, to whose liberal and enterprising spirit their expedition owed its origin and success. He then states, introductively, the principal obstacles to the practice of Aërostation, and their removal by the happy exercise of Mr. Green's ingenuity and heroic perseverance.

These impediments, Mr. M. says, consisted in the uncertainty and expense attending the process of inflation of the balloon with hydrogen gas; the dangers considered inseparable from the practice of aërial navigation; the difficulties which hitherto had baffled all attempts to give a direction to the machine; and the impossibility which every previous aëronaut had experienced, of remaining in the air a sufficient time to ensure the attainment of a sufficient distance. To remove these obstacles, and to reduce the aërial vehicle to a more certain issue, a vast extent of actual experience, united to an intellect capable of turning it to account, was absolutely required; and he emphatically declares that to the combination of both these high requisites, in the person of Mr. Charles Green, we are indebted for the entire results of all that is beneficial in the practice, or novel in the theory, of Aërostation—the most delightful and sublime of all sublunary enjoyments.

The first of the fore-mentioned impediments was surmounted by Mr. Green's discovery of the applicability of coal-gas to the purposes of inflation. Among other important advantages gained by this discovery, Mr. Monck Mason distinguishes the diminution of expense and risk, and the superior facility wherewith the coal-gas is retained in the balloon, owing to the greater subtilty of the particles of hydrogen, and the strong affinity they exhibit for those of the surrounding atmosphere. In a balloon sufficiently perfect to retain its contents of coal-gas unaltered in quality or amount for the space of six months, an equal quantity of hydrogen gas could not be maintained in equal purity for an equal number of weeks.

With respect to the danger usually considered as liable to occur in the exercise of Aërostation, much is not required, in Mr. M.'s estimation, to prove the fallacy of such fears. Mr. Green's two hundred and twenty-six ascents, undertaken at all periods of the year, without one disappointment to the public, and without one solitary instance of fatal consequences, or even of an accident having disagreeable results, Mr. M. thinks, ought to be a sufficient proof of how little danger is to be apprehended in the practice of Aërostation, when managed by a skilful leader, with the aid of those improvements which Mr. Green's experience originated and successfully applied.

Mr. M. M. abstains from making observations on the state of the aërostatic art, in respect of the power of guiding a balloon according to a given direction; the want of which is said by him to be generally considered as the greatest obstacle to its farther progress, and adaptation to the ordinary purposes of human life. As, however, the discussion of this question would extend to a considerable length, and as it formed no part of the project in pursuance of which the late aërial expedition was undertaken, he reserves the subject for a future and more elaborate investigation.

Mr. Green's previous discoveries are held, by their historian, as yielding in importance to that whereby he has succeeded in enabling the aëronaut to maintain the power of his balloon undiminished during the most protracted voyage he may be required to perform. Mr. Monck Mason describes this highly-appreciated discovery in the following terms:—

"In order fully to comprehend the value of this discovery, it is necessary that some idea should be had of the difficulties the late enterprize was intended to obviate, and of the effects they were calculated to produce upon the farther progress of Aërostation. When a balloon ascends to navigate the atmosphere, independent of a loss of power occasioned by its own imperfections, an incessant waste of its resources in gas and ballast becomes the inevitable consequence of its situation. No sooner has it quitted the earth than it is immediately subjected to the influence of a variety of circumstances tending to create a difference in its weight; augmenting or diminishing, as the case may be, the power by the means of which it is supported. The deposition or evaporation of humidity to the extent, in proportion to its size, of several hundred weight; the alternate heating and cooling of its gaseous contents by the remotion or interposition of clouds between the object itself and the influence of the solar rays, with a variety of other more secret, though not less powerful agencies, all so combine to destroy the equilibrium which it is the main object of the aëronaut to preserve, that scarcely a moment passess without some call for his interposition, either to check the descent of the balloon by the rejection of ballast, or to control its ascent by the proportionate discharge of gas; a process by which the whole power of the balloon, however great its dimensions, must in time be exhausted, and sooner or later terminate its career by succumbing to the laws of terrestrial gravitation. By the simple contrivance of a rope of the requisite magnitude and extent trailing on the ground beneath, (and if over the sea, with a sufficient quantity of liquid ballast contained in vessels floating on its surface), have all these difficulties been overcome, and all the features of the art completely and effectually reversed. Harnessed to the earth or ocean by a power too great for her to resist, it is in vain the balloon endeavours to change

the level of her onward course: every foot she would have been otherwise compelled to add to her elevation now only adds to her weight by her endeavours to abstract from the earth a further portion of that rope which is dependent upon its surface; while, on the other hand, every foot she would have been inclined to descend, had she been at liberty as heretofore, now only abstracts from the weight which draws her downward, by throwing on the earth the labour of supporting an additional portion of the guide-rope, which she would otherwise have had to sustain without relief. Limited to one unalterable plane, all the fluctuations above mentioned, whereby her irreparable stock of power became incessant waste, have thus completely been avoided, and not only her ascensive force maintained in its full vigour throughout a period determinable solely by her own imperfections, but at all times and under all circumstances; over the boundless ocean, without a landmark, in the densest fog, and throughout the darkest night, the exact direction of her course, as well as the very rate of her progress, determined with the utmost facility and most infallible results.

"The progress of the guide-rope being delayed to a certain extent by its motion over the more solid plane of the earth's surface, while the movement of the balloon is as freely as ever controlled by the propelling action of the wind, it is evident that the direction of the latter when in progress must ever be in advance of the former; a comparison, therefore, of the relative positions of these two objects by means of the compass, must at all times indicate the exact direction of her course; while, with equal certainty, an estimate can at once be obtained of the velocity with which she is proceeding, by observing the angle formed by the guide-rope and the vertical axis of the machine. In proportion as this angle enlarges, an increase in the rate of the balloon may be infallibly inferred, and, *vice versâ*, its diminution will be found to correspond exactly with the diminished velocity of her advance. When the rope is dependent perpendicularly, no angle of course is formed, and the machine may be considered perfectly stationary, or at least endowed with a rate of motion too insignificant to be either appreciable or important.

"The main feature, however, in this discovery, is the altered aspect under which it enables the aëronaut to regard the perils of the sea, and the consequent extension it bestows upon the hitherto limited sphere of his relations. The ocean, now no longer the dreaded enemy of the aërial voyager, becomes at once his greatest friend, and instead of opposing his progress, it offers him advantages more certain and efficacious than even the earth itself with all its presumed security is calculated to contribute."

Appended, in a foot-note to page 22 of Mr. M's. history, is an observation which deserves to be received as both new and curious. He represents it as a fact, that the sea, unless *perhaps* under circumstances of the most extraordinary agitation, does not in itself appear to be the parent of the slightest sound. Unopposed by any material obstacle, an awful stillness seems to reign over its motions. Neither is it probable he thinks, that even under *any* circumstances, no matter how violent, can any considerable disturbance arise from the conflict of its own opposing members. The impossibility of ever having been placed in a situation to bring this fact under the cognizance of our senses, is no doubt the reason why it has never before been noticed. On the shore or in the sea, no one has ever been present independent of that material support the absence of which is necessary to the success of the experiment: it is in the balloon alone, Mr. M. exultingly avers, that such a phenomenon could either have been verified or observed.

During the night of their adventurous journey, the aëronauts perceived the cold to be very intense, the thermometer ranging variously from within a few degrees below to the point of congelation. Their supplies of water, coffee, and oil were completely frozen in their several vessels. Strange, however, as the statement may appear, Mr. Monck Mason observes, while all around bore unequivocal testimony to the severity of the cold, the effects produced upon their persons, although undefended by any extraordinary precaution, were by no means commensurate to the cause, nor such as even, under ordinary circumstances, the party might fairly have expected to encounter. This unusual exemption from the consequences of a low temperature is ascribed by Mr. M. to the absence of all current of air, the natural result of their situation, and one of the peculiar characteristics of aërial navigation. To this intensity of cold, preceded by a long subjection to the action of a humid atmosphere, he likewise attributes the occurrence of an incident which merits particularly to be noticed. It is thus in Mr. M's. own words:—

"It was about half-past three in the morning when the balloon, having gained a sudden accession of power, owing to a discharge of ballast, began to rise with considerable rapidity, and ere we had taken the customary means to check her ascent, had already attained an elevation of upwards of twelve thousand feet. At this moment, while all around is impenetrable darkness and stillness, an unusual explosion issues from the machine above, followed instantaneously by a violent rustling of the silk and all the signs which may be supposed to accompany the bursting of the balloon in a region where nothing but itself exists to give occasion to such awful and unnatural disturbance. In the same instant the car, as if suddenly detached from its hold, becomes subjected to a violent concussion, and appears at once to be in the act of sinking with all its contents into the dark abyss below. A second and a third explosion follow in quick succession, accompanied by a recurrence of the same astounding effects; leaving not a doubt upon the mind of the unconscious voyager of the fate which nothing now appears capable of averting. In a moment after, all is tranquil and serene: the balloon has recovered her usual form and stillness, and nothing appears to designate the unnatural agitation to which she had been so lately and unaccountably subjected. The occurrence of this phenomenon, however strange it may appear, is nevertheless susceptible of the simplest resolution, and consists in the tendency to enlargement from remotion of pressure which the balloon experiences in rising from a low to a higher position in the atmosphere, and the resistance to this enlargement occasioned by the net-work, previously saturated with moisture and subsequently congealed into the elliptical form which the dependent weight of the car obliges it to assume whenever the shrunken capacity of the sphere it encompasses will admit of its longitudinal distension. As this resistance is occasioned by the intervention of a *non-elastic* medium—*the ice*—which has bound the meshes of the net-work in their contracted form, it is evident that the liberation occasioned by their disrupture will not take place until the internal pressure of the balloon has reached a certain amount, and then *suddenly* that liberation is accomplished, attended by those collateral effects which have already been described. The impression of the descent of the car, in the above representation, is evidently a false one: the car, so far from sinking, actually springs up: it is the unexpectedness of such a movement, and its apparent inconsistency with the laws of gravitation, that occasions the delusion, the reality of which the concomitant circumstances essentially tend to confirm."

Towards the conclusion of his sketches Mr. Monck Mason communicates a fact which merits much consideration, from its bearing upon an essential principle in Physiology. He affirms that, although he and his intelligent companions frequently rose to an elevation of above twelve thousand feet, occasionally higher, yet at no time did they experience the *slightest* effect upon their bodies, proceeding from the diminished pressure of the atmosphere. Nor, from their observations, does he believe that any such effects as are currently attributed to this diminished pressure have any actual existence, at least at any elevation to which any person has hitherto been enabled to arrive. He concludes, also, that the impressions experienced in the ascent of high mountains owe their effect to another cause, and proceed from the inordinate muscular exertion and its consequences upon the circulating system, and, he might have added, from the great exhaustion of vital energy which every laborious effort of this kind must necessarily produce.

The three intrepid aëronauts started on their adventurous expedition from Vauxhall Gardens, at one o'clock, p.m., of Monday, the 7th of November, 1836; and having traversed five hundred miles, over the land and the sea, completed an unparalleled journey at Weilburg, in Nassau, after remaining for eighteen hours suspended, in their cloud-compelling flight, between earth and heaven.

A History of British Birds, indigenous and migratory: including their Organization, Habits, and Relations; Remarks on Classification and Nomenclature, &c. Illustrated by Engravings. By Wm. MacGillivray, A.M., F.R.S.E., M.W.S., &c. Vol. I. London: Scott, Webster, and Geary. 1837. 8vo., pp. 631.

There are not persons wanting, even among the ranks of practical ornithologists, who will view with apathy and even with disgust this new attempt at a history of our native Ornithology; not that they either distrust the ability of the new candidate to their favour, or believe the subject he treats to be exhausted. True, the works already published on British Ornithology are both numerous and excellent, a proposition which we need only support by mentioning the names of Pennant, Montagu, Selby, and Mudie. Others have also published a host of works on the same subject, as Lewin, Graves, Albin, Donovan, Atkinson, Meyer; and various monographs have been issued by Bolton, Syme, Nash, &c. The greater part of these publications are, however, of little or no use; and although the volumes of Montagu and Selby are still classical authorities, we consider that as long as our native birds continue to be interesting to the ornithologists of this country, so long new British ornithologies must and will continue to appear at intervals. It is obvious that only a few are able competently to perform such a task. Those authors who engage in the work without being fit to carry it through will soon sink into merited oblivion; but those, on the contrary, who possess the requisite knowledge and ability, can-

not fail to benefit science by directing their labours to such an object. This being the case, it only remains to consider the plan and character of the work before us, of which only the first volume is at present vouchsafed to the public.

There is one feature in Mr. MacGillivray's book which, in our opinion, places it above all others on the same subject that have fallen under our notice; we allude to the observations on the internal structure of birds, minute particulars being given, not only of the class, but of each species. By preceding British ornithologists anatomy has been undeservedly neglected, their observations on this topic being, in general, few and meagre. Some continental naturalists, on the other hand, have erred in the opposite extreme, and conferred an undue importance on internal organization as a guide to classification. Cuvier's *Règne Animal* may be adduced as a striking instance of this, and also, we must add, the present *History* of Mr. MacGillivray. The system of the latter author does not differ materially from those propounded by various other writers, and long since exploded; and although he occasionally indulges in ridicule at the incongruities presented, according to his ideas, by quinary and other systematists, yet what can we say to his classing the Bee-eaters with the Swallows and Goatsuckers, and the Dippers with the Kingfishers? In so far as the three first-named genera may all be termed Volitatores, they unquestionably agree, and for ought we know to the contrary the internal structure may countenance the arrangement; but, taking all circumstances together, it cannot be considered otherwise than unnatural. As regards the Dipper *(Cinclus)*, its relationship to the *Turdidæ*, but more especially to the Ouzels, and most of all to the Garden Ouzel *(Merula hortensis)*, is so striking and obvious that we cannot but wonder at their separation by our author. The Garden Ouzel, though not partial to *rocky* streams, is a great lover of water; and we have seen the young of this species, before the tail was fully grown, so like the Dipper in form, colour, and habits, that a very slight stretch of the imagination might have converted the one species into the other. The tail of the Garden Ouzel, both old and young, is often cocked up in the manner of the Dipper, and the white breast of the latter —which, in a somewhat different shape, is found in the Ring Ouzel —appears to be alone wanting to render the illusion complete. It has been the common fault of nearly every author who has tried his hand at system-making to attend too exclusively to the one particular part of a bird which he considers most important for his purpose. Thus, Linneus fixed upon the bill, Vieillot the claws, Cuvier the internal organs, and so on. Tolerable classifications may be, and have been, formed from these and other characters taken separately; but we conceive that, to obtain anything like a "natural system," every part of the bird, both external and internal, must be examined. In our opinion the internal structure, taken alone, affords even a less eligible foundation for a system than an exclusive attention to the outward organs; and certainly if the classification of Mr. Mac-

Gillivray is sufficiently ably executed to afford a test of the truth of our position, we should say that the attempt to systematize according to the inward parts is a failure.

We have mentioned instances of what appear to us gross errors in our author's classification of the larger groups of birds. As regards the extent of his genera, he has almost invariably followed the most approved modern ornithologists, and in the one case in which he has deviated from these authorities it is probable few will be found to agree with him. We allude to the circumstance of his having placed the Green Grosbeak *(Coccothraustes chloris)* in the genus *Linaria*, because, says the author, the bill is not sufficiently thick and large in proportion to the size of the bird to entitle it to the rank of the Grosbeak. Now it so happens that in this, as in other instance, figures of the head and bill of the Haw Grosbeak and the Green Grosbeak are supplied. To these, the author triumphantly refers his readers as proofs of the justness of his views. But, unfortunately, the cut of the Green Grosbeak's head and bill is anything but correct; the latter is much too small, and we believe no ornithologist would recognize the familiar physiognomy of *C. chloris* in the drawing presented to him. The latter species unquestionably stands between the Haw Grosbeak and the Linnets, but few, we believe, will doubt that it is much more nearly allied to the Grosbeaks than to the Linnets. In making these strictures we ought, perhaps, to notice that our author does "not profess to add a new system to the many already in partial use," but "merely to disclose the order which I conceive to be best adapted for the present work." Still, whether or not he wishes that order to be followed by others, it must be and is a new system, as far as we understand the import of the word.

On the subject of nomenclature our author is not over eloquent, but he stands up for the necessity of giving *classical* scientific names, and holds that generic names should be of Greek, and specific of Latin, origin.* The former rule is important as regards the names of new birds, the latter we consider of no practical value.

As the subject of English nomenclature has of late attracted so much notice, the opinion of Mr. MacGillivray on that department may not be without interest.

"As to English names, very little needs be said, further than that were the genera positively fixed, which they cannot be for many years, if ever, it might be well to give them vernacular names, in which case each species ought to have a distinctive epithet or substantive name. Thus, we shall suppose a genus named *Corvus*, to consist of five species, named *corax*, *corone*, *cornix*, *frugilegus*, *monedula*. The English generic name being Crow, we might name the species Raven Crow, Carrion Crow, Hooded Crow, Rook Crow, Daw Crow. But in all cases single substantive names would be the best: for example, the Raven, the Corby, the Hoody, the Rook, the Daw. Some persons propose a general meeting of British ornithologists at London, York, or Edinburgh, for the purpose of determining the English nomencla-

* See *The Naturalist*, vol. ii., p. 150.

ture of our native birds; but such a meeting, were it to take place, would disperse without accomplishing the object in view, unless indeed its members were placed on the Bass Rock, and interdicted fire and food until they had settled all their differences, and sworn perpetual friendship. Even then, some malicious Celt, capable of subsisting a month on dulse and tangles, with an occasional raw Limpet or Mussel, might hold out until, rather than be starved, the philosophers should leave the birds to him to do with them as he pleased. In sober earnest, it is impossible to remedy the acknowledged defects in nomenclature, so as to render it universally acceptable. Some persons who do their best to render the subject still more intricate, are extremely sensitive on the point of uniformity; but, in my opinion, however much they who are ambitious of being legislators in this matter may desire conformity to their views, there will always be more to spurn the yoke than to yield to authority, which is gradually falling to its proper standard. In fact, no two ornithologists have ever used the same names for five hundred birds; nor could two be found who should employ the same nomenclature in describing even the birds of Britain. There is really no cause of regret in all this: were there no differences in politics, religion, and science, the world would probably be much worse than it is. I am therefore under the necessity of using my own discretion in bestowing English, Gaelic, and Latin names on the birds which I propose to describe; and I request that my readers scruple not to reject whatever they find indicative of bad taste or bad feeling."—p. 10.

This being the opinion of our author, the reader would certainly be but ill prepared to meet with the following passage, which we are at a loss to reconcile with the above observations.

A reason may here be assigned for altering the common name of this bird (the Red Grouse). The English name of *Tetrao* being Grouse, and that of *Lagopus* being Ptarmigan, it is obviously improper to bestow the appellation of Red Grouse on a species of the latter genus. But it may be said, the distinctive 'Red' ought to be retained. I think not. *Lagopus saliceti* is more properly red, *L. Scotious* is more brown than red, *L. cinereus* is grey in autumn, *L. rupestris* yellow in summer, and *L. leucurus* has a white tail, in which respect it differs from all the rest. Therefore I name these birds—*L. saliceti*, Red Ptarmigan; *L. Scoticus*, Brown Ptarmigan; *L. cinerius*, Grey Ptarmigan; *L. rupestris*, Yellow or Rock Ptarmigan; and *L. leucurus*, White-tailed Ptarmigan."

We should not have been sorry had similar reasoning been carried throughout the volume; but as this has not been done, part of the above passage appears somewhat out of place. In a few instances we find Latin names altered where the former designations were considered faulty. In one case, however, the change seems unnecessary; we allude to *Coccothraustes atrogularis* being substituted for *C. vulgaris*, while a name, in our opinion, equally good with the former already existed, namely, *C. cratægus*, Blyth.

At page 7 a sneer is indulged at the doctrine of analogies of Mr. Swainson, which appears to us much less ridiculous than Mr. MacGillivray would have us believe. Every one admits the more striking analogies between animals of different classes, but those which are less obvious of course require much more study than can be devoted to them by every one.

We have expressed partial disapprobation both at the system and

the nomenclature of the work under review, but fortunately the book contains much that fully atones for any trifling delinquencies in those departments; and if it has been found difficult to add much new matter relating to *habits*, the descriptions, being for the most part original and accurate, will be perused with considerable interest. The sections on the external and internal anatomy of the class are evidently written by one perfectly versed in the task he has undertaken. These chapters are illustrated, in a very superior manner, by numerous engravings, executed from drawings by the author.

Mr. MacGillivray reprobates, and with justice, the inattention of ornithologists to the internal anatomy of birds; and if we are not disposed to place so much confidence in it as a basis of classification as we find our author doing, we may at least agree with him in regretting the occurrence of such errors as the following, appearing, too, under the auspices of undoubtedly one of the first zoologists of the day. After describing the osseous system of birds, he says:—

"This superficial inspection of the osseous parts of birds will suffice to render the relations of the external parts intelligible, and prevent the student of Ornithology from falling into those strange mistakes to which persons are liable whose knowledge is not more than skin deep. I may be allowed to adduce a few examples from the *Natural History and Classification of Birds*, by William Swainson, Esq. 'The leg,' he says, 'is obviously divided into three parts: 1. The thigh; 2. The shank or tarsus; and 3. The foot itself, composed of the toes. The thigh is subject to very few variations beyond relative length, and in being more or less clothed with feathers. In aquatic birds it is generally naked before it reaches the knee-joint.' Never, in any aquatic bird, is the thigh naked; but it is obvious that Mr. Swainson is not aware that birds have a thigh. Again, 'the humerus [referring to the extremity of the cubitus] is generally termed the shoulder; the *flexum* [pointing to the wrist] is the shoulder joint; and the *axilla* [reference to the pollex] which corresponds to the *cubitus*, is commonly called the shoulder margin.' To mistake the wrist joint for the shoulder joint is a blunder which might have been avoided by inspecting a skeleton, or even feeling for the bones in the wing of any common bird."—p. 33.

Our author believes that

"It is very doubtful whether the sense of smell be acute in any order of birds; for it has been most satisfactorily proved by Mr. Audubon that in the Vultures, at least in those of the genus *Cathartes* that occur in North America, which were supposed to possess it in the greatest perfection, it is so inefficient as not to indicate to them the existence of putrid flesh in their immediate vicinity."—p. 51.

For an interesting instance in which some Crows were unquestionably directed to carrion by the sense of smell alone, we refer our readers to *The Naturalist*, vol. ii., p. 34.

In the account of the Red Grouse (*Lagopus Britannicus*) occurs an animated description of an adventure of the author's, in returning from a botanical excursion through the Hebrides and the south

of Scotland. This we had marked for extract, but regret our inability to graft it upon our pages, on account of its length.

"I object," says Mr. M'G., "to the specific name *mutus*, given to the Grey Ptarmigan, that the bird is not mute; and to *albus*, that the Willow Ptarmigan is equally white in winter. The latter species is in summer the only one of the three that is red, and therefore I would name it the Red Ptarmigan; while the species commonly called the Red Grouse, being less red than that just mentioned, and presenting a brown mottled appearance, might be named the Brown Ptarmigan; and the present species, being the only one that is at any time grey, ought therefore to be called the Grey Ptarmigan." —p. 210.

It is to us pleasing to find that our author is not inclined implicitly to adhere on all occasions to the names imposed by his predecessors. But it is good to observe moderation in all things, and in nothing is it more required than in the nomenclature of so extensive a field as Natural History. We are decidedly for expunging glaringly erroneous names from our catalogues; but as we conceive it vain to attempt to obtain unexceptionable designations, either for genera or species, in ninety-nine cases out of a hundred, it certainly is to be regretted when authors alter established names on slight grounds. We perceive no tenable objection to Red Grouse as applied to *Lagopus Britannicus*, and must protest against the changes suggested in the foregoing extract.

Our author has some pleasant chapters in his book entitled "Practical Ornithology, in the style of a Dialogue." In one of these we find the following passage. After mentioning the best methods of killing such birds as are not mortally wounded by the shot, his supposed companion says:—

"It is a barbarous business this practical Ornithology of yours, and one not well adapted for benevolent persons.

"Say not so; a surgeon is not necessarily a savage. Ladies indeed cannot become practical ornithologists, although they make no scruples in spitting insects; nor, I believe, Quakers, who, although they will not kill Cows, yet eat beef. I cannot account for these inconsistencies. Botany is the best study for ladies and other gentle beings; and Geology for the stout-hearted rough-shod gentlemen who do not choose to stick Beetles on pieces of cork, or fumble among piles of paper for dry blades. For my part I have tried them all; but the study of birds and quadrupeds, with the aid of powder and shot, is that which I prefer: and I know few occupations more delightful than that of poring over the entrails of a rare bird until you have satisfied yourself as to some minute points of structure."—p. 241.

In a subsequent page our author and his ideal companion chime in with each other, as might be supposed, very pleasantly as regards the doctrine of analogies. Ridicule can, however, never prove the doctrine to be ridiculous.

We admit, with Mr. Mac Gillivray, that the *Columbidæ*, as a whole, form a very natural and distinct group. Still it must be remembered that there exist species which it is really difficult to determine whether they rank properly in this or the neighbouring

division. As regards the name "Stock Pigeon," we think it highly improbable that the name was given on account of that species being supposed to be the original of the dove-cot race; it has been supposed to be rather from the fact of the bird building in the stunted trees termed "stocks."

The following passage is a good hint for those naturalists who when they meet with any bird at large in this country, no matter whether a Parrot or a Finch, a Honeysucker or a Wren, confidently add it to the British fauna:—

"These [*Columba palumbus*, *C. œnas*, *C. livia*, and *C. turtur*] are all the Pigeons that have any claims upon our consideration. An individual of the American Passenger Pigeon, *Ectopistes migratoria*, is recorded by Dr. Fleming, as having been shot in December, 1825, in the neighbourhood of a Pigeon-house at Westhall, in the parish of Monymeal, Fifeshire. The feathers, according to the describer of this specimen, 'were quite fresh and entire, like those of a wild bird.' Why not? If it had escaped from confinement and resided in a dovecot for half a year, it might have its plumage as neat as that of any other bird. Such a circumstance affords no criterion. A beautiful specimen of the Dominican Grosbeak, *Loxia Dominicana*, in perfect plumage, was sent to me fresh in the winter of 1831. It had been shot somewhere near Dalkeith, and I made a drawing of it for my collection of British birds; but soon after it was reported to have escaped from Lady Dalhousie's aviary. In June, 1835, a lovely little bird, fresh and with perfect plumage, was brought to me from Braid Hermitage, near Edinburgh, where it had been shot when in company with another of the same species, supposed to be the female. It turned out to be the *Loxia astrilda*. Its skin forms a part of my collection; but I should no more think of assigning this species a place among British birds than of admitting the Migratory Pigeon. Yet its claims are certainly equal, for its feathers 'were quite fresh and entire, like those of a wild bird,' and remain so to the present day."—p. 294.

At page 331 it is observed that albino individuals of the Chaff Finch sometimes occur, although the author has not met with a British one. We have never seen one quite white, but we once possessed a very curious specimen with as much of white as any other colour. The individual alluded to appeared above the usual size, though this was probably only an error of the stuffer. By the way, this reminds us of an observation of our author's which the student will do well to keep in mind:—

"As to a difference in size observed by persons visiting museums, I have only to remark, what every collector must know, that two birds of equal size prepared either as skins or as stuffed specimens by two individuals, may differ exceedingly in size. I knew a bird-stuffer who, in preparing Grouse, crammed them to the utmost, to make them look fine large birds; and a person who has collected about a hundred skins of British birds for me, has almost invariably made them much too short."—p. 210.

In the description of the House Sparrow our author alludes to what Mr. Neville Wood says relative to the supposed familiarity of the species, and agrees with the common opinion in this respect. We must, however, observe that the House Sparrow is remarkably distrustful of man considering that it lives so much in the neigh-

bourhood of our dwellings; and that it is much less approachable at any time—but more especially when it is abroad in the fields—than the Chaff Finch, Hedge Dunnock, Robin Redbreast, and various other birds of its size, we think almost every one will admit.—We wonder when the question as to the type of the *Fringillidæ* will be settled. Some consider it to be the Haw Grosbeak, others the Siskin Goldwing, others—with more propriety, we think—the Chaff Finch, and Mr. MacGillivray has added to the confusion by raising the House Sparrow to this important station.

If Mr. Swainson's reasoning relative to the *weakness* (!) of the Haw Grosbeak's bill is "a remarkable instance of false reasoning," we are not a whit the less disposed to blame our present author for *his* reason for separating the Haw and Green Grosbeak, but of this we have already said enough. It may here be interesting to notice, as there has been much disputing about the food of the Hedge Coalhood (*Pyrrhula pileata*, MacGill.), that our author thinks, "judging from the structure of its digestive organs, that such crude vegetable matters as buds could not afford it sufficient nourishment."

Our author is of opinion that Ravens and other carrion birds discover the existence of putrid food at great distances rather by the mode of flight and general behaviour of their neighbours than by their own sense of smell; and the supposition is at least plausible.

In the biography of the Carrion Crow an interesting account of the destructive propensities of this bird in the lambing season is inserted, from the pen of Mr. W. Hogg, shepherd, Stobo Hope, Peeblesshire, which we intended to have quoted had space permitted. Another letter, from Thomas Durham Weir, Esq., Boghead, Linlithgowshire, relating to the same species, is likewise supplied, which, for a similar reason, we must pass over.

If we may be allowed to judge by the following passage, our author has not attempted to discover the dispositions of birds by the development of their crania, which, however, the extensive collections to which he has access would give him ample opportunities for doing:—

"If the brains of birds are capable of being mapped, certainly the parish of Acquisitiveness ought to be remarkably large in these species [the Crows], as well as those of Cautiousness and Prudence [these two faculties are synonymous], for the dread of man in birds unable to cope with him is evidently not cowardice, but a reasonable and estimable feeling."—p. 558.

Mr. MacGillivray, we regret to say, is here beyond his depth. From what, we would ask, can cowardice proceed but the organ of Caution? and in that truly we can perceive nothing particularly "reasonable and estimable."

To sum up the merits and defects of the work before us: We are much pleased with the plan on which the descriptions of plumage, &c., are given, viz., a general and concise character of each species at first, with a full and detailed account afterwards. Thus it will, in general, be sufficient to read the former when perus-

ing the work, and omit the rest, as often tedious and uninteresting; but the full details will prove extremely useful, in many cases, in determining species where the distinguishing characters are few and intricate. The habits are related in a plain and unassuming but engaging manner; the anatomical particulars form a new and valuable feature of the book; and the principal synonyms are supplied at the head of each article. The engravings on wood and steel, for the most part, fully equal the expectations we had formed in this particular from the excellent drawings we have elsewhere seen from the pencil of Mr. MacGillivray. We regret, however, to notice that in many cases the wood-cuts of the heads—in our opinion, the most important illustrations in the work—are not executed with that exactitude which we could have desired. Many of them are good, several indifferent, but certainly, we must own, none very bad, if we except the head and bill of the Green Grosbeak, to which we have already alluded. In short, we only desiderate figures of the *entire* birds. It may be replied that these may be had in the works of Bewick and half a dozen other authors. But we should wish every work that is issued on British Ornithology to be as complete as possible in itself, in order that students whose means will not permit their purchasing more than one work on each department of Natural History may not be disappointed when they have made their selection, as it must be obvious that good figures, either coloured or plain, are far preferable to the most elaborate description.

We shall feel much pleasure in laying before our readers some account of the continuation of this work when published, and feel assured that our author will not blame us for giving our opinion of his first volume so freely and unreservedly.

Memorials of Shrewsbury; being a concise Description of the Town and its Environs, adapted as a general Guide for the Information of Visitors and Residents. By Henry Pidgeon. Shrewsbury: Eddowes. 1837. Sm. 8vo., pp. 225.

Shrewsbury is an interesting and important old town, and Mr. Pidgeon has treated his subject in such a manner as to render it acceptable to all classes of readers. The prevailing fault of the majority of our county and city memorials is their extreme dryness, which prevents their being of the slightest value to any but the learned few. The various topics contained in this neat little volume are, the situation, foundation, and etymology of Shrewsbury; its ancient history; castle and feudal state; present state of the town; ecclesiastical buildings; Royal Free Grammar School; local governments, charters, &c.; public buildings; charitable institutions; charity schools; walks within and without the walls; literary and scientific institutions; recreations; suburbs; Castle Foregate; Abbey Foregate; trade and manufactures; environs.

We are much pleased with both letter-press and illustrations;

the latter are numerous and highly creditable to the respective artists. We may bestow especial praise on the chapter dedicated to the ecclesiastical buildings, which will be alike interesting to the architect and the general reader. We could, however, have wished —as such minute attention is paid to the interior of the churches— that the accounts of the organs had been more detailed. The epithets "large," "small," "excellent," &c., as applied to this noble instrument, give the musician a most meagre and unsatisfactory idea of the quality of the various organs alluded to. Perhaps nine writers out of ten would not have condescended to bestow even so many words on this subject as Mr. Pidgeon has done; but surely it is as deserving of the attention of the reader as the church bells! Of course no "true Salopian" will lack this volume on his shelf; and even those who are not residents in this "favoured county" may find much to interest them in the *Memorials of Shrewsbury*.

Last Lecture of the Season, delivered in the Literary and Scientific Institution at Staines, on Friday, June 30, 1837. By the Rev. Robert Jones, D.D., M.R.S.L., &c. London: Hatchard and Son. pp. 32.

Dr. Jones possesses an untiring ardour in the grand cause of knowledge, as disseminated by provincial literary and scientific institutions, which, adequately conducted, cannot be valued too highly. Dr. Jones appears to think that a monthly journal devoted entirely to reports and transactions of provincial societies, similar to that of Staines, might advantageously be started. Were such a periodical set on foot, no one would be better qualified to preside over it than Dr. J.; but we feel convinced it could not answer. In the first place, those connected with the various establishments can alone be expected to take much interest in their transactions; and, secondly, the members would peruse the work in their own institution, without themselves taking it in. The same cause acts as a drag on the circulation of even *The Analyst* in many places, though, as our readers are aware, we have ever felt the warmest interest in the success of those very institutions which are in some measure detrimental to our interests. But, with Dr. Jones, we feel convinced of the immense importance of the Societies now everywhere arising around us, and shall, therefore, at all times consider it our duty and our pleasure to further their objects. The lecture before us is remarkable for elegance of style, soundness of thought, and liberality of sentiment.

A History of British Birds. By William Yarrell, F.L.S., Sec. Z.S. London: John Van Voorst. Part I. July, 1837. 8vo. and Royal 8vo.

This work is a continuation of the series commenced by the *British Fishes* of the same author, and the *British Quadrupeds* of

Bell. If, on account of the numerous and excellent works already published on native Ornithology, this work is less valuable than its predecessors, it by no means yields to them in its general character and execution. The principal characteristics of this publication are the extreme beauty of the woodcuts, the accuracy of the descriptions, the beauty of the "getting up," and the cheapness of the publication, which will come within the means of every student. We must not dismiss the first part without observing that the style of the wood-cuts has never been equalled, and that those of Bewick really look quite *coarse* after them, although we still consider the illustrations of the latter artist as valuable as when they were first laid before the admiring public.

Supplement to the Flora Metropolitana; or, Botanical Rambles within Thirty Miles of London. By Daniel Cooper, A.L.S. London: Highley. 1837.

Every subscriber to the *Flora Metropolitana* will of course procure the present *Supplement* to the work, which appears to be well-digested, and, as far as we have had an opportunity of judging, accurate.

FINE ARTS.

MUSIC.—VOCAL.

An Evening Service, and a Hundred Antiphonal Chants, with Remarks. By the Rev. W. H. Havergal, A.M. Paine & Hopkins, 69, Cornhill.

The Gresham Prize Composition, No. 6. By the same. J. A. Novello, 69, Dean-street, Soho.

To assist in raising the thoughts and affections to the supreme being, and, through the medium of the higher faculties, to increase our veneration for, and, as it were, to bring us into closer affinity with, him in whom we live, and move, and have our being, is the object of sacred music. As an instrument of improvement to the human race, its influence is undoubtedly great; great in proportion to the power with which it stimulates into healthful activity those faculties through which we instinctively recognize the existence of an eternal all-creative mind, and adore that mind when recognized. Who that has listened to the solemn roll of the pealing organ, re-

verberating through the holy aisles of some time-honoured edifice, or, perchance, to the swelling chorus of voices united in fitting praise and adoration of the Almighty, but has felt that he is better, we will even say greater, after what he has heard? High, then, is the rank which we award to sacred music; and noble, nay divine, is the mind which can exert such blessed influence on others, and, in defiance of the lapse of time and the change of fashions, be the instrument of solace, of happiness, and of improvement, to the generations of men for ever. But there is a spurious kind of sacred music, sacred in nothing but its subject; music grave without sublimity, frivolous without ornament. Minims and semibreves are the staple of this style; under them does solemn dullness seek and too often find shelter. Absence of all idea is its characteristic, correctness (if that can be called correct which so lamentably fails of its end) its only recommendation.

As a specimen of this falsely-called sacred music, the compositions before us are every way qualified to stand. Correct without genius, grave without grandeur, scarce a single sentiment of veneration are they calculated to excite, even in minds the most predisposed.

The chants are good, and the idea of varying the chant according to the character of the psalm excellent. Many an obvious absurdity (such as singing a joyful chant to a psalm of a mournful character) would thus be avoided.

Burn not, thou Taper, too intensely bright. The words by Sir Thomas Lawrence, the music composed by William Thorold Wood. T. Boosey & Co., 28, Holles-street.

In our January number we noticed with approbation some of the earlier productions of this composer. The characteristic of these was tenderness and simplicity. The song before us is of a more ambitious character. This is as it should be; the artist is never to stand still, or even to flag, in the search after ideal perfection. And truly delightful has it been to us to meet with the production of an amateur (as we know the author to be) which gives evidence of research into, and acquaintance with, the mysteries of art. This song belongs to that class of vocal music which aims at producing a perfect whole by bestowing equal attention on all the parts; which regards the accompaniment as an essential feature of the musical picture, as a means of strengthening and prolonging in the mind the emotions excited by the poetry and the vocal melody. Such is the principle which, carried into practice, has enabled the German school to outstrip its once invincible Italian rivals. It is needless to add that the combination of many melodies is a higher branch of the art than that which, neglecting the accompaniment, bestows exclusive attention on the vocal melody. A child, a peasant, may invent a pleasing melody, and any one who has studied Hamilton's *Catechism of Thorough Bass* may indite an accompaniment to match; but how wide is the interval between such patch-work and the simplest song

Mozart ever wrote! The mental exertion required in order to create, or even to understand, a whole is greater than the effort necessary to produce or comprehend a fragment. For this reason do the generality of composers, as well as listeners, prefer that which, although yielding but little credit, and gratification only faint and fleeting, requires neither high genius nor any noticeable expenditure of the "midnight oil" in its cultivation. When, therefore, a composer makes choice of the narrow and steep path which, though not destitute of thorns, will, if diligently trodden, procure him a place among those whose names pass not away with their own generation, it is the duty of those who guard the portals of cotemporary criticism to hold out to him every encouragement to disregard the fickle breath of popular applause, and to hold steadily onward in the search after ideal beauty. With this view we cordially recommend Mr. Wood's song to our readers, and feel assured that, on mature examination, they will admire as much as we do the symmetry and unity of the plan, and the accurate and, at the same time, poetical elaboration of the details.

INSTRUMENTAL.

Grand Duet for the Piano Forte. By Miss Mounsey. J. J. Ewer & Co., Bow Church-yard.

We have before had the gratification of speaking in terms of high praise of the compositions of this lady. To her we owe a double debt of gratitude; first, for the delight she affords us by her combinations of sweet sounds, and then for the pleasure we feel in being, through her means, freed from the irksome task of always finding fault. The rarity of true excellence gives additional charm to its discovery, whilst the frequent recurrence of what is worthy of condemnation by no means diminishes the pain with which we witness it. The duet before us consists of four movements, and in its form resembles rather the instrumental symphony than the piano forte concerto. Throughout is evinced a power and excellence of modulation which, in a piano-forte composition of the present day, astonishes while it delights us. The passages of fugue and imitation shew that the fair composer has by no means neglected the higher walks of the art, and (if we are not much mistaken) that she is every way worthy of treading in them. The minuet is graceful and characteristic; but the slow movement which succeeds it, for the elaborate and skilful treatment of the subject, the variety and boldness of the modulations, and for the vein of true poetry which pervades the whole, deserves an admiration which we fear we cannot adequately express. In taking leave of Miss Mounsey for the present, we beg leave to assure her that we shall feel pleasure in again and again welcoming to our critical tribunal the efforts of her genius, confident that what she is to write will be worthy of what she has already written.

The Goblin Quadrilles. Composed for the Piano-forte by Calder Cambell (Madras army). London: T. E. Purday, 50, St. Paul's Church-yard.

Mr. Cambell has certainly not been inspired by the "goblins," "spirits of fire," "water spirits," and "elfins," whom he has invoked both singly and conjointly. Of a truth they have treated him very scurvily. He has done all that he could to assist them in their revels; and lo and behold how they have rewarded him! One might have expected, at any rate, something of the elfin character about these quadrilles, something to make the hair stand erect, something hissing and boiling over, in consideration of the meeting of the fire and water spirits. All this it was rational to look for, and we accordingly did look for it. How were we astonished, then, on looking over the first page, to find it flat as ditch-water, or, to use a more savory simile, as champaigne that *ought* to be up. When we had a little recovered from our first amazement: "O, O!" said we to ourselves, "this must be one of your surprise concerns; there's something terrible over leaf, depend on it." In this belief, it was some time before we mustered courage to proceed; and when we did so, it was something in the manner of the frogs of old approaching King Log after his first splash—slowly and cautiously. Like them, however, we soon found there was nothing to fear, and that Mr. Calder Cambell was totally innocent of any but the most lamb-like, simple, and every-day ideas. Really, it is not the nerves of every one that could stand such trials often; and we do hope that when Mr. C. "again doth write" he will either brush up his enthusiasm, if he have any, to the proper pitch, or else light upon a *rather* less formidable title for his lucubrations.

Book of Musical Varieties. By Richard Sutton.

If each of the names on Mr. Sutton's subscription list was available for pecuniary as well as for ostentatious purposes, he has, we think, no reason to complain of the success of his speculation. He is, we dare say, in condition to snap his finger at our criticism; but we wish to say a few words to his subscribers and to those who may be so unlucky as to be canvassed in future. What Mr. Sutton is pleased to call "good feeling" is utterly inadmissible in such cases. Consider yourselves, for the time being, as the guardians of the interests of the art: let no personal motives of friendship induce you to patronize a work which you know to be unworthy of patronage. Or, if "good feeling" *is* to be admitted, shew yourselves *really* friendly, and sincerely advise the "composer" to avoid committing himself before the public, and robbing his friends' pockets. What, indeed, can be more impudent, more insulting, in the would-be composer, than thanks to his friends for supporting his work, without reference to the merits of that work? to speak plainly, for raising a subscription to enrich the modest Mr. Sutton, or whoever he may

happen to be, for the race is numerous enough. As to the *Varieties*, our opinion of them it is unnecessary to deliver, for Mr. Sutton, in his preface, has given them condemnation sufficient, and has stated pretty plainly that, though but poor things intrinsically, they have served their purpose to *him*. We heartily congratulate him, and hope his subscribers are equally satisfied. We fancy they will have had enough of "good feeling" for some time to come.

The Sacred Musical Amulet; a Selection of Melodies from the works of J. S. Bach, Beethoven, Cherubini, Gluck, &c., to which are added several new compositions. By C. McHorkell. London: R. Cocks & Co., 20, Princes-street, Hanover-square. 1837.

In a work which one sees, at the first glance, is intended for the Sabbath evening recreation of the "serious young lady," we expected certainly to find in abundance adaptations (as they are ironically called) of opera airs, fragments of the slow movements of symphonies, and disjointed excerpts from the masses of foreign composers, to verses (poetry we dare not call it) of sickly religious sentiment, or displays of unredeemed bad taste. All this we expected, and we have found it. But there is one piece of music the discovery of which in such a collection has delighted us in proportion to its unexpectedness; we mean the song by Sebastian Bach, by the greatest chance in the world (as we cannot but think) standing entire and unmangled, in all its native loveliness. Such a piece atones for many a fault in the rest of the work. Mr. Gauntlett's song is pretty, and with a few alterations might almost be faultless. We will mention one: if the melody in the fifth bar from the end were B♭ and C leading up to D, instead of G, the passage would be graceful and original, instead of being, as it now is, bald and abrupt. The "vision of dry bones" might have been dispensed with, words and all; if any one can sing it through, preserving his gravity, it is a wonder. We have nothing to say against the outer integuments and getting-up of the work, and only wish that the internal structure were equally excellent.

Preludes and Fugue in A Major, for the Organ, with a part for the Pedal Obligato. By Egerton Webbe. London: J. A. Novello, 69, Dean-street, Soho.

Mr. Webbe comes out in his first work a learned and experienced musician. He has not inflicted on the public the first crude essays of his genius, but has studied and practised in private, striving to merit a fame lasting beyond the present hour. If he do not obtain it he alone will be to blame; for his present work, if it do not deserve to live, shows at least that by patient and persevering cultivation of his genius he may undoubtedly succeed in producing others which may. What is most wanted in this composition, par-

ticularly in the fugue, is the art of concealing art, a certain appearance of facility, which, combined with depth of thought, is itself the highest result and aim of study. We hope Mr. Webbe will zealously pursue the course he has so successfully entered upon, and never rest satisfied, whatever excellence he may attain.

MISCELLANEOUS COMMUNICATIONS.

THE FACULTY OF LOCALITY IN PIGEONS.—A Liege journal gives a remarkable instance of the activity of the organ of Locality in the Pigeon. A Pigeon-fancier of Verviers went to Turin in 1832, taking with him a number of these birds, which he let loose. A short time ago one of these winged messengers returned safely to Verviers after five years absence. Whether the return of this single bird to its old habitation was mere chance or not, is a matter of doubt; but be this as it may, the *faculty* which enables the possessor to remember places is unquestionably strong in the Pigeon, and especially in the Carrier Pigeon.—ED.

DESTRUCTION OF INSECTS.—At the last meeting of the Horticultural Society, a communication was read from Mr. Ingram, of Southampton, on a simple and efficacious method of destroying the Red Spider, Green Fly Thrip, Scale, and other insects obnoxious to vegetation, without any injury to the plant. It consisted merely in placing the plants within a frame firmly closed, and putting between the pots Laurel leaves well bruised. After remaining in this state for about an hour it will be found that all the two former insects are destroyed, and the plants must then be removed to a warm place; but an exposure to the vapour of the leaves for about eight hours is found necessary for the removal of the Thrip and Scale. For a house 20 feet by 12, two bushels of leaves are sufficient, which may be bruised inside; the roof and sides are to be kept close with matting, and the night time is considered best for the purpose. The effects are to be attributed to the hydrocyanic [or prussic.—ED.] acid evolved from the leaves, which agrees with a recommendation made by Mr. Waterhouse, at a late meeting of the Entomological Society, for the destruction of insects in the canvass of pictures or wood of the frames (see *The Naturalist*, vol. ii., p. 92), and in old books, &c., similar to the plan he employs in destroying insects in specimens of Natural History. It consists in introducing a few drops of prussic acid into a box closed as tight as possible, and placing therein the infested article, when the destruction of insects will be very quick, as will be seen by their falling to the bottom of the box, which has sometimes been quite covered with them, although a small quantity only of the acid has been employed.—*Communicated by* CHARLES LIVERPOOL, M.D., *Plymouth, August* 6, 1837.

ARGONAUTS.—The long-disputed question of whether the animal found in the shell of the *Argonauta* be parasitical or not, seems as far from being settled as ever, notwithstanding the observatons of Madame Power, and the experiments of Captain Rang, of the Port of Algiers; the arguments on one

side being most ingeniously adopted by the contrary side in favour of their reasons. All that appears certain is, that it swims backwards, like other animals of the same kind, and makes use of its two long palmated arms, with which it envelopes the shell, as if holding it on. A report made to the *Académie des Sciences* of Paris, on the proceedings of Captain Rang, concludes with a request to that gentleman to make the following observations, which we extract for the sake of others who may be inclined to put them in practice:—1st. To make the animal quit the shell, in the manner of Mr. Cranch's experiment, both in and out of the water, and especially in shallow places on the sea shore; 2nd. To ascertain the sexes of the individuals provided with shells, and whether they contain eggs; 3rd. Carefully to examine the position of all the individuals in the shells, whether they are taken from the bottom of the sea or from the surface, and see whether the position be alike in both instances; 4th. To repeat Madame Power's experiment, and ascertain whether the separation made of the broken shell by the animal takes place on the edge of the shell as well as elsewhere, and to note the duration of the experiment; 5th. To examine the nature of the piece of shell thus reproduced, with a magnifying glass and with chemical tests, and compare it with the rest of the shell, examined in the same manner; 6th. To repeat the second experiment of Madame Power, if it be possible, and find out if (against all analogy) the shell be not existing in the egg, whether it appears on the animal a few days after birth, and to note all the circumstances of its appearance and development.

Church Music.—It may safely be asserted that no nation can boast of so many sterling composers for the organ as the English; and in order to support this assertion it will only be necessary to mention the names of Purcell, Orlando Gibbons, Croft, Child, Boyce, &c. But, at the same time, in no other civilized country is church music so shamefully neglected. It is true that almost every parish church throughout the kingdom has a good organ; but where is the advantage of this, when the choice of an organist and the training of singers are almost, it may be said, left to chance? The organists of many of our *cathedrals* are excellent musicians and performers, but the singing is never what it ought to be, and the selection of music is anything but satisfactory. Music is almost universally considered indispensable in the service of the Church of England: why then limit it to the performance of a few psalms, badly played and worse sung? The only mode of removing this stigma from our church, would be to increase the salary of the organist very considerably, and at the same time to require him to organize the choir on week days, so as to be able to sing anthems, &c., in such a manner that competent musicians might be able to attend divine service without offence to their ears. That this would be a means of improving the taste of the English, both musical and general, cannot, we think, admit of dispute.—Ed.

Phrenology.—At Vienna, in 1796, Dr. Gall for the first time delivered lectures on his system. Thus, although nearly 6,000 years have elapsed since the creation of man, the most important discovery ever made has been known only within the last forty years. Gall will ever be regarded as the greatest benefactor of his species. What Galileo has achieved for Astronomy, Harvey for Anatomy, Hahnemann for Medicine, that has Gall achieved for a subject which eclipses them all—for the Mind: and to use the words

of Mr. Combe, "in our applause he hears not the voice of a vain adulation, but a feeble overture to the grand strain of admiration which a grateful posterity will one day sound to his name."—*From a Lecture on Phrenology, delivered at the Campsall Society for the Acquisition of Knowledge, by Mr. C. T. Wood, jun.*

The advance which Phrenology has made within a few years, though gradual, is most striking; and the voice of him who speaks against the science is listened to with surprise rather than, as before, that of its advocate. The newspapers and other public journals, moreover, no longer raise their feeble clamor to aid in its demolition. Probably, however, it is, even now, more to the pecuniary advantage of a magazine, whether quarterly or monthly, to ridicule than to support Phrenology: but the majority of these pursue the wiser course of remaining altogether silent on the subject.—Ed.

The Name "Garden Thrush," as applied to Turdus Musicus, *Auct.*—In *The Analyst*, No. xviii., I find the name "Garden Thrush" proposed to be substituted for Song Thrush. I should have given the name Garden Thrush to the Missel Thrush: at least its habits here would warrant such an appellation. I knew of five nests in gardens last year, and have already found one in a similar situation this year, snowy as it is.—Thomas Allis, *York, 3rd Mo.* 24, 1837, *in The Naturalist (No.* xi., *for August), edited by Neville Wood, Esq.*—[The Missel Thrush occasionally frequents gardens, with the view of feeding on currants, gooseberries, &c.; but it generally breeds in small plantations near houses, and is, on the whole, not much seen in gardens; while, on the contrary, the species which we have named the Garden Thrush seldom occurs out of them.—Ed.]

Theory of Music.—It seems very odd that school-masters and music-masters should have hit upon the most laborious and irksome method they could posibly have devised for imparting to their pupils a knowledge of the "grammar" of language and music; namely, by separating the theory from the practice. That a pupil might write grammatically, both as regards language and music, without having been told any one of the rules composing grammar, is very certain, though at present seldom acknowledged. Some eminent musicians and music-masters are for discarding theory altogether, whether studied abstractedly or otherwise. The plan, no doubt, is feasible; but if theory is to be retained, let it go hand in hand with practice, the two being included in the same lesson, and much tedious and useless drudgery will be spared, both on the part of master and scholar.—Ed.

Tetracnemus diversicornis, *Westwood.*—This insect is figured in Charlesworth's (alias *Loudon's*) *Magazine of Natural History*, vol. i., n. s., p. 258, with four branches to the antennæ. When I first saw it, I thought it was the same as my *Ceraphron samicornis*, being very similar as far as antennæ go. But mine is more like Mr. Curtis's figure of *C. Halidayi*, except that it has only three branches to the antennæ, and is scarcely more than half its size. I took my specimen on a Birch at Knighton Heath, near Dorchester, August 11, 1832; also Mr. Westwood's *T. diversicornis* on an Oak in Coombe Wood, July 3, 1835.—J. C. Dale, *Glanville's Wootton, Dorsetshire, May* 30, 1837.

Musical Catechisms.—Hamilton has published various musical catechisms; amongst others one on the organ. We have a great horror of compilations of this nature; and the fact that a work of more value on the organ

would be suffered to rot on the bookseller's shelf only proves the benighted state of the English with regard to this noble instrument. We had proposed skimming the pages of this little 18mo., but when we reached the passage where the author observes that "*next to the swell in importance was the introduction of pedals*," we shut the book, observing to ourselves that no real love of the organ could have actuated the compiler to pen his little catch-penny. —Ed.

Effects of Prussic Acid on a Rabbit.—At the conclusion of a lecture delivered at Maidstone, by Dr. Robinson, on poisons, the effect of prussic acid was tried upon a Rabbit. Three drops were administered from a glass—the surface of which most probably abstracted half the quantity—and the animal immediately exhibited the usual symptoms of rapidly approaching dissolution. In order to give it a chance of recovery, however, a few drops of ammonia were administered, without apparent benefit. A constant stream of cold water was then poured upon the base of the skull and along the spine, when the animal very shortly exhibited signs of resuscitation. It was then wrapped in warm flannel. In a quarter of an hour it was sufficiently recovered to walk. Dr. Robinson mentioned that this mode of treatment had been discovered by accident. A Cat, which had been annoying to the apprentices of a chemist, was poisoned by them with prussic acid. By mere chance, however, it fell under a stream of cold water which was pouring from a pump, the effect of which was its gradual resuscitation. Benefiting by this hint, the same means have been applied to more than one human subject who had taken prussic acid. No instance, however, had before come within Dr. Robinson's knowledge where an animal had been restored after the symptoms this Rabbit exhibited. The Rabbit is now in full health and vigour.

Organized Beings.—The reports of the Academy of Sciences in France have been filled by the voluminous papers of M. Isidore Geoffroy St. Hilaire, M. Moquin Tandon, and M. de Serres. The first treats of the possibility of extending our knowledge of the natural history of man by the study of domestic animals, which, according to the author, will, from its strong affinity [*analogy ?*—Ed. *An.*] with the subject, elucidate many important effects. The second concerns the formation of vegetables, proceeding either from a centripetal or a centrifugal force. The third has for its subject the development of the genus *Rotellina*. One and all are based upon the system of M. Geoffroy St. Hilaire; that is, the unity of the creation, or the existence of but one great type.—*Athenæum.*

The Basilisk.—This reptile is of a very harmless nature, though by some means or other inheriting a most formidable name. The application of the fabled names of antiquity, such as the Cockatrice, the Dragon, and the Basilisk, to the realities of modern Natural History, is not only absurd, but must, in some instances, be attended with bad consequences. Men read with horror, in their boyish days, of the terrible powers of Dragons and the deadly venom of Cockatrices and Basilisks; venom so deadly that it not only killed all else upon which the terrible creatures looked, but if they happened to meet the reflection of their own withering glances from a mirror or a pool of water, they could not escape the death-stroke of their own looks. These terrific qualities make a deep impression upon the youthful mind; and as the name is the index to all the terrors, the repetition of it necessarily suggests

them. Thus there must be a most curious conflict between memory and present perception when the Dragon is found to be a creature that can hurt nothing stronger than a Fly, or that the Basilisk is a harmless and pretty little creature—for, although peculiar in shape, it is pretty—that lives upon small vegetable seeds, and neither hurts nor is capable of hurting a single living creature. The reality which addresses itself immediately to the senses must, in the end, get the victory, how hard soever the impression on the memory may plead. Thus the fable is discarded, and takes along with it all which it in any way holds linked by association. The school and scholarship, and all that is connected either with the one or the other, come in for their share of the doubt, disbelief, and derision; and that which, but for the discovery, would have continued to afford excitement, and therefore pleasure, becomes the foundation of self-humiliation and reproach. Either, therefore, the fable should be given up, or the name which turns it into a mockery should cease to be used. The fable has its use in attracting the mind at an age at which it could not be attracted by reality. Boyhood, when the hopes are full of the joys of years unborn, is a time of romance, and all the utilitarians that ever lectured will never make it otherwise. And it is well for us that they cannot; for the reality of life is the painful portion of it, and the romance the pleasurable. Not only so, but that which the utilitarians call the reality is the sensual, the animal, the material part of life; and the romance is the mental or intellectual part. If the former is made the sole object of consideration, then the result is misery in this life and no hope hereafter. There is consequently an immediate and utter extinction of all that is pleasant in life, of all that is endearing in society; because there remains no value but money value, and "*Thy money perish with thee*" is the denunciation which takes effect both here and hereafter.

We are not pleading for fables, or attempting to recommend that which is not true at the expense of the truth. But in "the youth of life" it is vain to refer to that which in after life is called "utility," as the only or the chief incentive to study. You cannot, at every step of a boy's education, draw his attention to his book, or his other study, by the allurement of the "price that it will bring him in;" and if you could, what a mean and sordid creature, nay, what an immoral and dishonest creature, you would make of him! If we labour to impress upon the young mind the idea that there is no value but in possessions, and no reward but in pecuniary payment, we absolutely, in express terms, teach fraud and theft, destroy all the better feelings of the mind, and make man no better than a beast. We take the very worst view of the worst conduct of human beings as the foundation of character; and then we need not wonder that our pupil ripens into crime: and as the law is not abolished, the feeling which we thus inculcate, that law and justice are evils, because restraints upon *utility*, renders him obnoxious to punishment. Little romantic extravagancies appear to be as necessary for young minds as they are for young nations, among which they have ever been found; and though they are only "play" in after-life, both with the one and the other, yet the period when they cease altogether is the dotage of senility—the sad condition from which earthly hope has for ever departed. It is, therefore, always to be regretted when the reality spoils a fable which gives pleasure: and the instructor who preaches truth in this wise is exactly the counterpart of him who should go about to make a man zealous and enterprising in his

business by disclosing to him at the outset all the failures, impositions, frauds, and misfortunes, to which he should be subjected in the course of it. Applying the fabulous names of the ancients to the real productions of Nature is but one form of this mode of making knowledge the destroyer of happiness, but it is one which brings no good to compensate the evil. It destroys the marvel of the boy, but enough of that marvel remains to turn into ridicule and contempt the knowledge of the man. The withering power which the eyes of the fabled Basilisk were endowed with gives point to some of the choicest passages in poetry; and to persons of fine feelings these passages give more abundant and exquisite pleasure than they could purchase in "the market," even if they had the wealth of the Indies to lay out in the purchase of it. Now if, along with these passages, there comes always the conviction that the said Basilisk is equally frail and harmless as a Butterfly among the flowers, there remains no more pleasure—derision, contempt, is the natural feeling. It is of no use to plead that it is a different Basilisk altogether, for there is identity in the name; and if the fabled name has been bestowed upon a reality which has not the attributes of the fable, then the bestower of that name has been guilty of a falsehood. Any one who wishes to judge how much of poetic enjoyment may and must be destroyed by this misappropriation of names that had their meaning before, may turn to the second scene of Richard the Third, and read on to this line, spoken by Lady Anne:—

"Would they were Basilisks, to strike thee dead!"

Substitute the word "Butterflies" for "Basilisks;" read the line thus:—

"Would they were Butterflies, to strike thee dead!"

and feel the power of the scene if you can. Yet the Butterfly of Natural History is quite as likely to strike one dead as the Natural History Basilisk; and thus, while the application of the fabled name destroys the force of the fable, the memory of the fable turns the real animal into ridicule. The application of sounding names where there is no analogy to warrant their use, has done much mischief in all the departments of Natural History, and also in all the other subjects from which these names are taken.

The Basilisk of antiquity (and it was gravely described by Pliny and Galen among the ancients, and has been so by Lobo, Prosper Alpini, and Aldrovandi, among the moderns) was a terrible creature. Among the pools and lakes of that land of marvels which gave source to the mighty flood of the Nile, it reigned in terrible majesty; but it reigned in desolation. Its name was derived from the Greek word βασιλεύομαι, "to reign." It had eight feet, two large scales for wings, was of a golden yellow, and its head

"The likeness of a kingly crown had on."

The taint which it communicated to the air was more deadly than that fabled of the Upas-tree, and believed by naturalists; for no animal could breathe the same air and live, and its glance was instant death, even to the Lion himself. Nature could not, of course, form such a creature in the ordinary

way, but, like the Cockatrice—the dread of which has perhaps not altogether ceased in this country—it was hatched by a serpent out of the egg of a Cock! Though adopted by very sage and learned naturalists in the plenitude of their credulity, and continued by their copyists, the Basilisk of the ancients was purely a poetical creation, the emblem of regal tyranny, in short; and its origin was made unnatural, and the scene of its dominion laid in the desert, because to have spoken more plainly at home might not have been altogether safe. It does not follow, however, that the ancient poet who imagined the fable believed in the material existence of the Basilisk any more than Milton did in that of his personifications of Sin and Death, or Shakspeare in those ghosts which he conjured up with such matchless skill, and upon which the poetic beauty and the moral grandeur of some of his best passages are made so much to depend. We have deemed it advisable to notice, in this striking instance of it, the prostitution of poetic or allegorical names to the subjects in Natural History.—PARTINGTON'S *Natural History.*

THE BADGER.—This is a very quiet and inoffensive animal, more so, perhaps, than any other quadruped of the same size, for it hurts neither animal nor plant, at least in those species in which man takes an interest, or upon which he sets a value. Its food is understood to be fruits, roots, and grass, and also insects and other small animals, though not any thing larger than a lizard or a frog. It is not capable of climbing, and thus it can injure nothing which grows or perches upon trees, bushes, or tall stems; and as it usually keeps its burrow during the day, the live part of its food must consist only of those creatures which come out to feed during the night, many of the mollusca, and other small animals having that habit. It is thus very probable that Badgers are of service as scavengers in those places which lie near their burrows, by destroying animals which, but for them, would, in the natural state of those rude places, become noxious from their numbers, and destructive from their havoc upon vegetation. In some parts of the country, the Badgers have been most unfairly accused of invading the mansions of the dead for the purpose of gratifying their appetite. Their facility in burrowing and their offensive odour may both contribute to strengthen such a prejudice on the part of the ignorant. But it is nevertheless totally without foundation. Badgers burrow not for the purpose of eating, but that they may have warm and safe berths, which they render comfortable by bedding them with soft grass; and they would not eat the contents of graves, even if offered to them without any trouble on their part. The writer of this article remembers, when a boy, being present at the extirpation of a small colony of Badgers, which stood accused, by current report, of this species of profanation. The surface of an upland, but rather rich district, was finely diversified by swelling knolls along the north bank of a winding rivulet; and as the rivulet had, according to the custom of rivulets, "taken from the height and given to the hollow," there were steep and tangled banks at different places, open to the south-west, which was the descent side of the country; was snug and warm, and as well adapted for both birds and Badgers, as thickets of fragrant Broom upon sloping banks could be. The name of the Badgers operated in some sort as a protection to the birds, as the boys seemed afraid to venture far into the brake in their nesting excursions, lest they should slip a leg into a Badger's hole, and be drawn out minus a toe or even a foot. So Linnets, and Blackcaps, and Whitethroats reared their broods, and sung "round" in high

glee, protected by the mighty name of the Badger.—One of these tangled banks was immediately below an ancient place of sepulture, where, previously to the Reformation, there had been a little chapel. This place was still the burial-ground for the barony; and it was a place not altogether free from the suspicion of things unearthly. There was a large equisetum-tufted pool, between the knoll of which the cemetry occupied the summit and the higher grounds above; and *ignes fatui* sometimes sported on its margins, under the suspicious name of "elfin candles." Besides, immediately under the south-west angle of the little enclosure, there flowed a fountain of pure and sparkling water, so abundant that it would have sufficed permanently to turn a mill. This fountain abated not a jot of its quantity and altered not a degree of its temperature, summer or winter, wet or dry; and while all around was coated with snow to the depth of two or three feet, this fountain not only remained "clear in the eye," but the stream from it flowed smoking along an open channel, proof alike against the powdering snow and the curdling frost. The springs of these things, fountain and all, lay deeper than the rustic philosophy, and thus, as the general custom is, they were sent to the limbo of superstition, and all who dwelt immediately thereabout along with them. The sod upon some graves, one summer, sunk deeper than had ever been known to proceed from the mere insatiate yawning of that "daughter of the Horse-leech" for the relatives of the occupant; and the suspicion of foul play—to the brim of horror's deep chalice—fell upon the Badgers. The "landwehr" were summoned; and they came girt with fierceness or with fear, and armed with spades, mattocks, and pitchforks, to take by sap and mine the stronghold of the grey-pates, and let the light of heaven shine upon the den of their secret abominations. One party plied the work with mattock and spade, while another stood with their arms prepared in case the besieged should make a hostile sortie, or attempt escape; and to guard against the latter some dozen of curs had been brought as auxiliaries.—At length they came to a little chamber, in which there was a small quantity of withered grass, but not a single vestige of bone or other animal remains. Again they worked away; and soon the male Badger made his appearance and his escape, the opening ranks on either side greatly contributing to speed the latter, and one man declared, with "*ecce signum*" display, that the monster had "dinted his steel spade with only a passing snap." Two or three grievous whines from the curs gave proof that the Badger could "dint" something else, and soon a most triumphant flourish of yelping announced that he was fairly in the next cover and the danger over.—It was now resolved to change the mode of attack, and proceed by fire and smoke. When these were continued till all within must be either roasted or suffocated, they began to dig anew, and after passing another chamber which contained only grass as before, they came to a third, containing the bodies of a suffocated female and three cubs, the latter very small in size, and two of them clinging to the teats of their mother. These bodies were not treated with that decorum which became a generous foe in the hour of victory. It was found that the excavation reached no farther than the entrance and the three chambers, so that the Badgers could have had no subterraneous communication with the graves, which rendered the sunken appearance more a matter of alarm than ever. Throughout the whole burrow, there was not the smallest vestige of any animal remains—nothing but "beddings" of grass, rather

more abundant in the chamber where the family was than in any of the others. The result of the search did not, however, remove all stigma from the character of the Badgers. The story is mentioned as one instance of the means by which the characters of animals come to be misrepresented. They have one or two traits of appearance or habit which do not suit the popular taste, and by means of loose analogies, often drawn from subjects of a totally different character, others are added, till the truth is completely buried under a mass of exaggeration.—*Partington's Natural History.*

AUSTRIAN MUSIC AND DANCING.—The darling passion of the Austrian Mountainers, is for music and the dance. They appear born with a taste for music. A violin or guitar is a part of the furniture of every cottage, and not unfrequently a piano—each valley has its own peculiar airs, full of sweetness and melody. They are similar to those which the Tyrolese Minstrels made so popular in England a few years ago, and which are nothing more than the ordinary songs of the shepherds and dairy-maids on the mountains. They carol forth these lays with a peculiar intonation of the voice within the throat, making the echoes ring with their wild notes. The talent of improvising is not uncommon among the peasants of Tyrol and Styria; but it may be supposed their verses have little claim to polish or harmony. They generally assume the form of a dialogue; the verses of one being taken up and answered by another: they are mostly satirical, and the chief merits of the composer seem to consist in a quickness of repartee; one party striving by jests to render the other ridiculous. Sometimes the verses assume the more tender shape of a lover's address to his mistress, and his eloquence and skill are exerted in attempting to soften her heart—her wit being directed to repel his ardour and to laugh at his passion. In some parts of Tyrol, the peasants compose entire plays, of which they themselves are the actors. The subjects are usually taken from the well-known legend of a saint, or from some incident in Holy Writ; and, in this respect, they are not unlike the ancient "Miracles and Mysteries"—the first theatrical performances known in England. Their pretensions to plot and elegant versification are very humble. The performers, in some instances, are girls, who represent both the male and female characters. It is in the villages around Inspruck that these plays are most in fashion. The visitor will be amused there by such a homely effort of the tragic muse.

No fete-day, holiday, or marriage passes off without a rustic ball. Such entertainments afford the traveller insight into the manners and customs of the people, and an opportunity of observing the varieties of costume and amusement: those, however, who have formed their notion of a Tyrolese dance from a ballet at the Opera, will be much disappointed. They will find the dancers assembled in the close low room of an inn, so thronged that it would appear impossible to move, much less to dance, among the crowd: yet no sooner does the music strike up than the whole is in a whirl. No jostling or confusion occurs, and the time of the waltz is kept with most unerring precision. Instead of the elegant costume of the theatre—short petticoats and flying ribands—they will find the lasses decked out in pointed hats or round fur or woollen caps, or in handkerchiefs tied under their chin, and with waists reaching up near to their necks. The men often wear Hessian boots, which they strike together with great clatter by way of beating time, every now and then uttering a shrill cry and leaping round in the air exactly

in the manner of the Highland Fling. The enthusiasm, almost approaching to frenzy, with which the dance is kept up, in spite of the heat and crowd, from noon till night, is truly surprising. The partners often sieze each other by the shoulders, in an attitude not unlike hugging. They do not always follow the same monotonous revolution; but at one time the man steps round his partner; at another, lifting her arm high in the air, he twirls her round on her heel with a rapidity that makes her appear to spin, and then quickly re-uniting they resume their circular evolutions with an agility and perseverance truly marvellous.—*Guide to Southern Germany.*

ALPINE PASTURAGE.—From the elevation of a great part of its surface above the level at which corn grows, the Tyrol is necessarily a pastoral country. The wealth of its inhabitants lies in cattle, which furnish milk and cheese, their principal food. Scanty crops of Buckwheat, Rye, and Oats are cultivated as high as the climate will allow in the secondary valleys; but in consequence of the vicissitudes of temperature, the crop, when cut, is not allowed to remain on the ground: it is either conveyed at once under roof, or, if made into sheaves, it is stuck upon light wooden staves with branching arms, the uppermost sheaf being spread as a roof over those below it. A line of these stakes looks, at a distance, like an army of giants. The natural meadows which clothe the mountain sides furnish, even up to the verge of perpetual snows, a short thin herbage of the most nutritious kind, very palatable to the cattle. In the early spring, when the Cows are first driven out of the stalls in which they have passed the winter, they are confined to the lower part of the valley: but as fast as the lower meadows are exhausted and the snow disappears from the higher pastures under the influence of the summer sun, the cattle are driven upwards. The meadows producing the thickest grass are set apart for a hay crop; and, when cut, this is hung to dry on racks consisting of horizontal poles, supported between two upright posts, and covered with a narrow roof to turn aside the rain. It is then stored in isolated barns or challets, and is dealt out as wanted with the strictest economy. In order to save it as much as possible, the cattle are sometimes fed on stalks of maize sprinkled with salt, or upon the leaves of the ash, which are stripped from the tree for this purpose. The real life of the cowherd of the Alps differs widely from the beau-ideal of poetry and romance. For six or eight months he is banished from the haunts of men, above the clouds, occupying a wretched challet, perhaps half-buried in the ground to prevent its being carried away by avalanches. He must be constantly on the alert to prevent his charge from straggling or falling over precipices, and he must be prepared to protect them from the bear and the wolf. After such arduous labours and anxious care, it can easily be understood that the day on which the cattle return home from the Alps is a day of rejoicing both to the master and cowherd, provided the supply of butter and cheese be large, the herd healthy, and no casualties have diminished its numbers. Their return usually takes place about Michaelmas, or St. Matthew's day.—Wreaths of flowers, ribands, and bells are sent up the mountains before hand to decorate the animals, which make their entry marshalled in regular procession. At their head marches the pride of the herd (the most distinguished for size and beauty), who has invariably proved his right to precedence by combats with the rest, which the herdsman rather promotes than checks, knowing that they will conduce to future tranquillity as soon as the matter is once settled. The

victor is entitled to wear the largest wreath and bear the most sonorous bell attached to his neck by an ornamented belt. He shows by his steady gait that he is fully aware of the dignity. From time to time he gazes round to observe that none break the rank; and should some heedless bull-calf venture to press forward out of his place, he is speedily reminded of his proper position by a poke in the side from the horns of the indignant leader. The rest of the herd are provided, according to their pretensions, with trappings and bells; and the din and uproar which prevail in a town, caused by a clatter of metal intermingled with the shouts of herdsmen and the lowing cattle, when the herds of different proprietors enter at the same time, produce a scene not unlike one of those unmusical concerts which the French call a *Charivari*. Such tinklings are anything but drowsy. Behind the cattle walks the herdsman, or *senner*, decked out in his best, with a bunch of gay flowers and a sprig of rosemary in his hat. He drags after him a thick thong of leather, fifteen or twenty feet long, which ever and anon, by a strong exertion of muscular force, he wields above his head and cracks like a whip, but with a report as loud as a pistol, much to the edification of the spectators and to the terror of all stragglers and loiterers in the herd. The farmer, or proprietor, brings up the rear, riding in a neat small cart laden with rich butter and cheese.—*Idem.*

Pass of the Stelvio.—This very remarkable road, the highest in Europe practicable for carriages, being 2,300 feet, or nearly half a mile, perpendicular above the Simplon, and 1,000 feet above the Great St. Bernard, was constructed by the Austrian Government in order to open an additional line of communication from Inspruck to Milan, between Vienna and the centre of Lombardy. It was completed in 1824. Whether we consider the boldness of the design, the difficulties of its execution from the great height and exposure to storms and avalanches, or the grandure of the scenery through which it passes, the rout of the Stelvio is the most extraordinary in Europe. The galleries cut for miles through the solid rock, along the margin of the lake of Como; those higher up built of massive masonry strong enough to resist the fall of avalanches; the long causeways carried over morasses; the bridges thrown across torrents; the long succession of zig-zag terraces carried up with so gradual a slope that an English mail-coach might trot up on one side, and scarce require to lock a wheel on the other, which nevertheless scale and surmount one of the highest ridges in the Alps; these are works which, without exaggeration, deserve to be called stupendous. But the works and agencies of Nature with which they come in contrast reduce them to comparative insignificance. This road, upon which so much labour and treasure has been expended, is seldom passable for more than four months in the year, from June to October. Every spring, when the snow disappears, the ravages of the winter's storm and avalanche are disclosed to view; wooden galleries broken through, large tracts of the road swept away, others overwhelmed with rubbish and fragments of rock. These injuries, annually occurring, are to be repaired only at the vast expense of 11,000 florins a-year, and after a lapse of considerable time. From June to the beginning of October, the passage is generally secure from all risk, except immediately after a fall of snow. Under such circumstances it is prudent to wait twenty-four hours. The most interesting scenes on the rout are the shores of the Como lake and its excavated galleries, the gorge of Spondalunga, the splendid view

of the range of the Orteler Spits with its snowy glaciers seen from the highest point of the pass, and the glaciers on the Tyrolese side which the traveller, rolling along in his carriage, first looks down upon, and approaches near enough to throw a stone upon them—a prospect which no other Alpine carriage-road presents in any other part of the world.—*Idem.*

ALPINE FORESTS.—The magnitude and number of the Tyrolese and Styrian forests forms one of the distinguishing features of those countries, when compared with Switzerland. They cover the middle regions of the Alps, and encroach more than the latter upon the verge of the cultivated fields, which occupy the lower part of the valleys. The character of the forests of the Austrian Alps has been drawn by the masterly pen of the author of *Vathek*. "There seemed no end to these forests, except where little irregular spots of herbage, grazed by cattle, intervened. Whenever we gained an eminence it was only to discover more ranges of dark wood, variegated with meadows and glittering streams. White Clover and a profusion of sweet-scented flowers clothe their banks; above waves the Mountain Ash, glowing with scarlet berries; beyond rise hills, and rocks, and mountains, piled upon one another, and fringed with Fir to their topmost acclivities. Perhaps the Norwegian forests alone equal these in grandeur and extent. Those which cover the Swiss Highlands rarely convey such vast ideas. There the woods climb only half-way up their ascents, which then are circumscribed by snows; here no boundaries are set to their progress, and from their bases to their summits the mountains display rich unbroken masses of vegetation." At first it might appear that these vast store-houses of timber, from their extreme remoteness and the difficulty of access, would hardly be of any value to man, and that the trees would be allowed to ripen and rot, undisturbed by the axe, on the spot where Nature sowed them. This is by no means the case. There are many remote districts of the Austrian Alps where timber is the sole produce, where the people draw their subsistence entirely from the forests; and human ingenuity has contrived means by which the stately stem of the Tyrolese Larch, which has grown to maturity close to the glaciers of the Orteler Spitz, is transported to the arsenal of Venice or the port of Trieste, while that which has flourished near the fountain-head of the Salza, may be found, in the course of a few months from the time when it has quitted its native forests, serving as a mast to some vessel of war or merchandise on the Black Sea. There can be no difficulty in the transport of timber growing on the borders of a navigable river; but it is a different thing when it grows at the distance of many miles from any stream capable of floating a log, or where the streams flow in a direction opposite to that in which the wood is to be carried. The first of these obstacles is overcome by means of slides (called *riesen*), which are semicircular troughs formed of six or eight Fir-trees placed side by side, and smoothed by stripping off the bark, and extending sometimes a length of many miles. They are constructed so as to preserve a gradual descent, are not always straight, but made to curve round the shoulders of the mountains, being carried in tunnels through projecting rocks, or conducted over ravines and depressions on the tops of tall stems like the piers of a bridge, until they terminate on the borders of some stream capable of carrying them onwards. The great slide of Alpnach was constructed in the same manner; it was, however, a first attempt, and did not succeed. The Austrian forests are every where traversed by these contrivances,

which form, in fact, the inclined plane of a rude railroad for the timber. Let the traveller take heed in passing these slides after snow or rain has fallen. The wood-cutter waits for such favourable opportunities, when the ground is slippery, and the rivers are high, to launch forth the timber which has been cut many weeks before. The logs descend with the rapidity of an arrow, and it would be certain destruction to encounter one in its course; so great is the force they acquire in their descent, that if by chance a log strikes against any impediment in the sides of the slide, it is tossed out by the shock, and either snapped in two like wax, or shivered to splinters. The streams which traverse a forest-district are often so shallow, and so much impeded by rocks, that even after rain they would be insufficient to carry the wood. In such cases a strong dam is built across the stream, at a point where its channel is narrowest, usually at the mouth of a gorge; and the waters are pent up by sluice-gates until they have risen so as to form an artificial lake. In this sheet of water the logs are collected from the surrounding forests. At a given signal the sluice-gates are opened, and the pent up waters force their way down the valley, bearing along the wood with which they are freighted, until they reach a larger stream capable of floating it without artificial aid. A few only of the finest trunks are formed into rafts, and transported down the Danube into the Black Sea, or into the Adriatic, for ship-building. The greater part of the wood is consumed in the country where it grows for fuel, for supplying the salt-pans and mines, or it is converted into charcoal for the smelting and forging of iron. But it constantly happens that a ridge of high mountains intervenes between the forests and the salt-works and furnaces; and that the timber grows on the opposite side of the hills, where the stream flows in a contrary direction to the point where it is wanted. Under such circumstances the trees, instead of being thrown down from the height, must be carried up the ascent, which is, of course, much more difficult. The transport is then effected by means of a vast inclined plane, extending from the bottom of the valley to the summit of the nearest cliff or height overhanging it. A number of waggons are constructed to run up and down it, in a sort of rail-road. When loaded they are attached by ropes to a species of windlass communicating with a water-wheel, which is put in motion by turning on it the stream of a mountain torrent. By this means they are raised to the top of a precipice many hundred feet high, and are then transported down the opposite side in the usual manner. The business of the woodman affords occupation for a great number of persons. They set out early in spring in gangs, and repair to the spot where the wood is most abundant and of the finest growth; they build themselves rude huts of logs and branches, and begin lustily to ply the axe. The trees are then sorted into stems fit for masts or ship-building, which is merely lopped, and into wood fit for fuel, which is cut into logs, split, and dried; the whole is then heaped up in vast stacks. As soon as the winter has fairly set in, and the snow has fallen deep, so as to fill up the hollows in the mountains, the wood-cutter puts the cramp-irons upon his feet, and, either by the aid of oxen or upon a hand-sledge, conveys the wood to the borders of some neighbouring precipice, or to the side of one of the slides above mentioned. The snow is partially removed from the trough of the slides, and a few logs are thrown down to smooth it and make the passage clear. Water is also poured down it, which speedily freezes and covers it with a sheet of ice. This serves to diminish

greatly the friction and assists the rapidity of the wood's descent. The logs are then discharged, and descend with the quickness of lightning into the depth below, passing in a few minutes over a distance of several miles. The effect of such a discharge is much heightened when the slide terminates on the brow of a precipice overlooking a lake. The mountains around re-echo with a report like that of thunder: vast trees, hurled forth with the ease of a bundle of sticks, clear half the width of the lake in their leap; and, descending with a splash into its waters, ruffle the surface far and wide, and strew it, as it were, with the fragments of a wreck. The duties of a woodman do not end when he has thus discharged the wood; many logs and stems are arrested in their progress by some projecting mass of rock or tuft of bushes, and may be seen adhering to the sides of the ravine or precipice, looking, at a distance, like straws scattered over the hill-side. The woodman must disengage these, and see them fairly and prosperously on their way. At times, where the timber falls from a great height, the hardy woodman is let down by a cord, axe in hand, in the face of a precipice or cataract, to clear away all obstructions. In like manner he must push off and set afloat the timber which runs aground, or is stranded in the bed of the river. For the purpose of collecting the swimming wood, a species of barrier or grating of wood is erected across the rivers, at the entrance of the great valleys, or in the neighbourhood of the salt-pans and charcoal furnaces. It is here arrested and sorted, according to its quality, by the persons to whom it belongs. Different proprietors distinguish the wood belonging to each of them by cutting the logs of a particular length, so that, even when several owners discharge their timber into the river at the same time, it is easily sorted and appropriated. A tax of a certain sum upon every stack of wood, is paid for the use of the river and the services of the woodmen. In some of the remote forests trees of huge dimensions may be met with, giants of the vegetable creation. A Larch which stood near Matsch, in the Vintschgan, was called "The King of the Larches," since seven men could scarcely surround its trunk with outstretched arms. A Fir *(Pinus picea)* growing on the Martinsberg, in the forest-district of Zerl, measured five feet in diameter at nine feet from the ground, and at a height of between ninety and ninety-five feet from the ground still retained a diameter of between eight and nine inches. The species of Fir called by naturalists *Pinus cembra*, which grows only on the limits of vegetation on the borders of glaciers and everlasting snow, is much prized in the Tyrol, as well as in Switzerland, for the facility with which it is cut in figures, bowls, spoons, and other utensils and toys. It is out of this wood that the inhabitants of the Grodnerthal carve the crucifixes which are so abundantly dispersed in the Tyrol, and the pretty toys of Berchtesgaden are made of the same material.—*Idem.*

THE CRYPTOGAMOUS PLANTS.—Mr. W. A. Leighton, of Shrewsbury, has published a "Catalogue of the *Cellulares*, or Flowerless Plants of Great Britain, or those included in the Linnean Class, *Cryptogamia;* compiled from Sir W. J. Hooker's *English Flora*, Sir J. E. Smith's *English Flora*, Mackay's *Flora Hibernica*, Henslow's *Catalogue of British Plants*, and other sources." Mr. L. is of opinion that the increased and increasing study of the cryptogamic tribes affords a sufficient apology for the publication of a Catalogue which has for its sole object the facilitating an interchange of specimens, as well as to form a convenient index to those already in the herbarium; and,

if this is interleaved, as it always ought, to be a register of the localities where the rarer species are to be found. His arrangement, as modified from those of the best modern British botanists, is explained in a prefatory notice. He adds the authority for each species and variety; and for those varieties which have not hitherto received an acknowledged name, he has framed one as far as possible characteristic of their peculiarities, to which is appended the name of the author who considers the plant as a variety, with a distinguishing mark prefixed. This Catalogue of Mr. Leighton's displays evidences of being constructed with extraordinary attention to accuracy and usefulness; and although his entire list of cryptogamous vegetables does not extend beyond thirteen pages, it constitutes an admirable approximation to perfection in the accomplishment of its objects.

Geological Excursion.—Professor Phillips, accompanied by several members of the Philosophical Institution of Birmingham, with some other friends, lately made a geological excursion along the new line of canal to the Lime caverns at Dudley. The Basaltic columns at Rowley, the Wren's Nest, and the Lime caverns were the principal objects of attention in the day's excursion, and the Professor communicated the following observations on the Geology of this interesting district:—*Rowley Hills.* The party visited a characteristic point of this undulated range of Basaltic rocks above the Brades, where a considerable exposure of columnar rocks has been made for the purpose of obtaining materials for mending the roads. These columns are jointed across, and the interest of the locality is augmented by the influence of atmospheric decomposition on the surface of the stone. Professor Phillips took occasion to notice, with regard to the structure of Pyrogenous rocks in general, and Basaltic rocks in particular, "that the directions of the columns or prisms was almost invariably rectangular to the surfaces within which the rock was confined and by which its rate of cooling was influenced. If these surfaces are horizontal, the prisms are vertical; if vertical, the prisms lie horizontally." The jointed structure of the prisms he referred to that tendency observed by Mr. Gregory Watt in fused igneous masses to solidify round centres into globular concretions; and he pointed out the extreme resemblance which these jointed rocks offer (when, under the influence of atmospheric decomposition, the angular joints become flattened spheroids) to the celebrated *Kasekeller*, which he has examined near Bertrich, in the Eyfel—so called from the resemblance of these pillars, composed of flattened spheroids, to heaps of cheeses.—*Wren's Nest.* The rocks seen in this extraordinary range compose the upper part of the Silurian system of Mr. Murchison, and consist, in descending order, (as the canal penetrates them) of Shale, called Lower Ludlow rocks,—*Limestone of Dudley, and Wenlock Shale.* The Limestone of Dudley is in two divisions, separated by a good thickness of Shaly beds, which, as well as the Limestone, are fossiliferous. Both of the calcareous portions yield good Limestone, and as the inclination of the strata in the hill is very steep, the entrance of the canal has afforded extraordinary facilities for working these valuable rocks. The strata dip or decline each way from the central line or axis of the Wren's Nest hill, which is nearly north and south, and thus it happens that, in perforating this hill, the strata are found on one side dipping 70° to the east, and on the other 45° or more to the west. Remarkably long joints were observed in the subterranean works, which were measured by Professor Phillips, and explained to the

party as of great interest in questions recently brought under discussion as to the forces originally concerned in consolidating and subsequently in uplifting the strata. He proceeded to notice numerous spar veins; and he observed, "From the information of the very intelligent managers of the underground works, the effects of dislocations or disruptions of the rocks were ascertained to follow a certain geometrical law, which has been often insisted upon by myself, and admitted by Mr. Hopkins in his excellent paper on Physical Geology in the Cambridge Transactions. The Wren's Nest hill is one of several hills, all composed of Limestone and Shale, subjacent to the Coal formation, and directed from north to south. It appears probable, from the appearances at the south end of the Wren's Nest, that the *elevation* of this interesting ridge was accomplished before the rocks were consolidated, since the strata are found to bend round in a manner difficult to understand, unless the rocks were soft at the time of the movement. The Coal formation is *generally* conformed to the Silurian Limestones and Shales." The Coal is charred near the Rowley Basalt; and it was suggested by the Professor that these and other interesting phenomena might deserve the special investigation of the Philosophical Institution, and ample illustration by a collection of characteristic specimens.

EXTRACTS FROM FOREIGN JOURNALS.

METEOROLOGY.

On the Tempests of Western India. By Mr. W. Bedfield, of New York.—The object of this paper is, to prove that the violent storms which so often visit the islands of the Atlantic do not present an erratic and indeterminate character, but, on the contrary, that they are remarkably regular. After researches founded on facts, the author announces that these blasts of wind generally follow the same direction, namely, to the north-west between the tropics, and at a latitude of 30° north. Near this parallel the tempest turns to the north, and subsequently its direction is north-east, in a region occupying the elevated latitudes of the Atlantic. The course thus pursued by the hurricane is wholly independent of the direction of the wind which it may present in the different points it traverses. In fact, observation points out that, in similar cases, the wind always moves like a vortex round a common centre, during the entire progress of the hurricane, in a circuit limited by the lateral extent of the tempest, and in a fixed direction, from left to right, that is, from west to south. Thus the general course of the hurricanes of the Atlantic seems to be that of the great marine current called "gulf-stream."—*Bibliothèque Universelle de Genève.*

CHEMISTRY.

CONGELATION OF MERCURY IN THE OPEN AIR AT GARDINER, MAINE, NORTH AMERICA. BY MR. HALL.—It was extremely cold on the 28th of January, 1817. A bed of charcoal was placed toward evening upon a quay, three hundred feet from any habitation. A little mercury was placed in blackened phials. The thermometer indicated — 29° (— 27°, 1, R.) at ten o'clock at night. At half-past three in the morning it altered to — 32° (— 28°, 4, R.). At half-past six it was — 40° (— 32°, R.). The mercury was fluid in the phials, but some drops which had been placed in a hollow cavity in the charcoal was partly congealed. When touched with a small stick, the mercury separated into angular and evidently crystalline fragments. This appearance, destroyed by the heat occasioned by the body of the observer, re-appeared at seven o'clock, but soon afterwards the rising of the sun put an end to the experiment.

SOLUBILITY OF OXIDE OF LEAD IN WATER.—M. Bonsdorff announces that oxide of lead, prepared by exposing the metal to a damp air, or even by decomposing with fire nitrate of lead, is entirely soluble in water. Seven thousand parts of water are required to dissolve one of the oxide, and the solution presents a powerful alkaline re-action, colours syrup of violets green, and is an excellent exciter of carbonic acid.

MINERALOGY.

CRYSTAL OF COLUMBITE OF REMARKABLY LARGE DIMENSIONS.—Some years ago a new source of Columbite was discovered inclosed in a mass of feldspath, near Middletown, U. S. The crystals found there have already been described in Mr. Shepard's *Mineralogy*, and "are remarkable," according to him, "for their regularity, their brightness, and their very large size. Some of them weigh from three to four ounces. The substances associated with the columbite are uranite, albite, and phosphoric lime." Very lately a still larger mass of columbite has been found in the same locality, it weighs 6lbs. 12oz.; the entire mass weighs 14lbs., but it was already much broken when taken from the bed. This piece, although sufficiently irregular, evidently forms part of a regular crystal, the incidence of whose faces might have been determined by the goniometer. In its interior are fixed pieces of feldspath and quartz, and some of the faces of fracture are bordered with uranite. The specific weight of this specimen is 5,4.—SILLIMAN'S *American Journal, July*, 1836.

BOTANY.

ON STIPULES.—Stipulæ are sometimes considered as distinct organs from the leaves, sometimes as accessories of the true leaves. The following passage, extracted from the second edition (London, 1835) of Dr. Lindley's *Introduction to Botany*, may tend to settle this question. "Nothing is commoner than to find (in Roses) a leaflet accompanying a stipule; and in a specimen of *Rosa bracteata*, which I have examined, there were no stipules, but in their place two pennate, exstipulate leaves. Consequently, stipules should be considered as leaves in a rudimentary state.—*Bibliothèque Universelle de Genève, February*, 1837.

COMPARATIVE ESTIMATE OF THE METEOROLOGICAL CIRCUMSTANCES UNDER WHICH CORN, MAIZE, AND POTATOES, VEGETATE AT THE EQUATOR AND UNDER THE TEMPERATE ZONE.—In comparing the results which he has collected, M. Boussingault* arrives at this conclusion: The number of days which separates the commencement of the vegetation of an annual plant is, in each climate, in inverse ratio to the mean temperature under the influence of which the vegetation takes place; so that the product of this number of days by the temperature is constant. This result, says M. B., is not only important as proving that the same annual plant receives throughout, during its existence, an equal quantity of heat, but it may also enable us to foresee the possibility of acclimating a plant in any country of which the mean temperature of the months is known.—*Compte rendu de l'Academie des Sciences, January* 30, 1837.

OBITUARY.

Mr. Edward Donovan, F.L.S., author of works on *British Birds*, *British Insects*, *British Fishes*, and on the Insects of India and New Holland, all splendidly illustrated, died February 1, 1837, leaving behind him a large family in destitute circumstances.

Henry Adolph Schrader, Professor of Botany at Göttingen, author of *Spicilegium Floræ Germanicæ*, 1794, and *Flora Germanica*, vol. 1st, 1806, and of various essays on exotic plants, has recently departed for another world.† His *Flora Germanica* has a high reputation, but it only extends through the class *Triandria*. There is an elaborate and very useful list of the botanical writers of Germany at the commencement. The *Flora Britannica* of Smith is spoken of in Germany as inferior only to the *Flora Germanica* of Schrader.

Adam Afzaleus, Professor of Botany at Upsal, and the Nestor of scientific men in Sweden, died January 30, 1837, aged 86. He was the last pupil of Linneus, and distinguished, like all the pupils of that great man, for his exact botanical knowledge. He is celebrated for his travels in Asia and Africa, and contributed two papers to the *Transactions of the Linnean Society*, "On the Botanical History of *Trifolium alpestre*, *T. medium*, and *T. pratense*, in 1798. Professor Afzaleus resided in Sierra Leone for several years, and published his principal work, *Genera Plantarum Guineensium*, in 1804. He also wrote several dissertations on the medicinal plants of Sierra Leone, besides some other works. His African herbarium is now in the British Museum. His younger brothers, John and Peter—the former devoted to Chemistry, the latter to Medicine—are both distinguished for their talents, and have, for nearly half a century, occupied chairs in the University of Upsal.

* In the *Bibliotheque Universelle de Geneve*—an excellent monthly miscellany—an interesting table of the results obtained by M. B. are given, to which we refer our readers for further particulars.—EDS. *An.*

† We should be glad if any correspondent could favour us with the exact date of the demise of Schrader.—EDS. *An.*

LITERARY INTELLIGENCE.

WORKS IN THE PRESS.

Memoirs of the Life of William Wilberforce, with portraits, by his Sons.

Life of Admiral the Earl Howe; from authentic manuscripts never before published; consisting of between four and five hundred letters in the Earl's own hand-writing, his private journal while at sea with his flag, several letters of his late Majesty, George III., to his family, and various communications from living Flag-officers who served under the Admiral's command, by Sir John Barrow, Bart.

Moore's Letters, Journals, and Life of Lord Byron; with notes, portrait and frontispiece.

Account of the Private Life, Manners, Customs, Religion, Government, Arts, Laws, and Early History of the Ancient Egyptians, derived from the study of hieroglyphics, sculpture, paintings, and other works of art still existing, compared with the accounts of ancient authors; illustrated by many hundred engravings in wood and stone, from original drawings copied by the author from tombs, during ten years residence, in Egypt, Thebes, &c.; by I. G. Wilkinson.

Remains of the late Lord Viscount Royston, with a Memoir of his Life; by the Rev. Henry Pepys, B.D.

Moorcroft and Trebeck's Travels in the Panjab, Ladakh, Kashmir, &c., countries, either imperfectly explored by European Travellers, or never before visited by them; with illustrations and a map: prepared for publication by H. H. Wilson, Professor of Sanscrit in the University of Oxford.

Travels in Arabia—in the Province of Oman, in the Peninsula of Mount Sinai, and along the Shores of the Red Sea; with maps and illustrations; by Lieutenant Wellsted, F.R.S.

The "Silurian System of Rocks," as developed in the Counties of Salop, Hereford, Montgomery, Radnor, Brecon, Caermarthen, and Pembroke; with sketches of all the accompanying formations, a large geological map, sections, views, and other illustrations; by R. I. Murchison, Esq.

Education in Holland, with special reference to the Schools for the Working Classes; translated from the French of Victor Cousin, by Leonard Horner, Esq., F.R.S.

The Plays of Sophocles, with Notes selected from the best Commentators, and abridged for the use of Students, with a Life of Sophocles; by the Rev. G. Woods, M.A.

A Flora of Jamaica; or a Dissertation on the Plants of that Island, arranged according to the natural Orders; with an Appendix containing an enumeration of the Genera according to the Linnean System, and an Essay on the Geographical Distribution of the Species; by James Macfadyen, M.D.

We believe Dr. Curie has in the press a work entitled *The Practice of Homœopathy.*

SELECT LIST OF NEW PUBLICATIONS,

From May 8th to September 8th, 1837.

Alexander's Voyage to Western Africa, 2 vols. 8vo., 32s.
Arundale's Tour of Jerusalem and Mount Sinai, 4to., 25s.
Babbage's Ninth Bridgewater Treatise, 8vo., 9s. 6d.
Bardwell's Temples, Ancient and Modern, royal 8vo., 21s.
Bateman's Orchidaceæ of Mexico, folio, part i., 42s.
Bivouac (Maxwell's), or Stories of the Peninsular War, 3 vols. post 8vo., 31s. 6d.
Bell's History of British Quadrupeds, 8vo. 28s., royal 8vo. 56s., imperial 8vo. 84s.
Bosworth's Scandinavian Literature, royal 8vo., 4s. 6d.; Germanic and Scandinavian Languages, royal 8vo., 20s.
Britton's and Wild's Lincoln Cathedral, 4to. 25s., large paper, 31s. 6d.
Browne on Insanity and Asylums, post 8vo., 5s.
Brydges' Moral Axioms for the Young, 18mo., 3s. 6d.
Bushnan's Philosophy of Instinct and Reason, fcap 8vo., 5s.
Caveler's Specimens of Gothic Architecture, 4to. 63s., large paper, 105s.
Cherubini's Course of Counterpoint and Fugue, by Hamilton, 2 vols. 8vo., 42s.
Cochrane's Wanderings in Greece, 2 vols. 8vo., 24s.
Cogswell's Essay on the Properties of Iodine, 8vo., 5s.
Coverdale's (Miles) Letters of the Martyrs, 1564, 8vo. 10s., large paper, 14s.
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METEOROLOGICAL REPORT.

JUNE.

1837	Barometer.		Thermometer.		Remarks.		
June.	Morn.	Even.	Max.	Min.	Day.	Night.	Wind.
1	29.480	29.580	64	50	Sun, clouds, wind	Showers	W. N. W.
2		29.518	61.5	46	Fine, cloudy		
3	29.500	29.551	57		Cloudy, showers		Northerly
4	29.566	29.646	67	40	Fine, light showers evg.	Fine	S. W.
5	29.664	29.698	64	53	Fine, distant thunder	Fine, cloudy	Westerly
6	29.664	29.714	62	47	Hot sun, cool breeze	Fine	N. N. E.
7	29.694	29.549	58	43	All sun, cool breeze	Fine	N. E.
8	29.449	29.348	56	38	Chilly breeze, fine	Cold	Easterly
9	29.300	28.988	63		Heavy rain afternoon		S. E.
10	29.038	29.014	62.5	50	Fine, windy	Showers	S. W.
11	29.202	29.352	62	51	Fine, sun, clouds	High wind	Westerly
12	29.380	29.266	60	51	Steady rain all morn.		S. W.
13	29.260	29.200	64	56	Cloudy, dark, showers	Cloudy	S. W.
14	29.278	29.450	67	57	Fine, hot sun	Cloudy	W N.W.
15	29.488	29.464	69	50	Hot sun, cool airs	Fine	Northerly
16	29.442	29.352	74	55	Fine, thnd. storm aftrn.	Fine	S. W.
17	29.404	29.388	67	51	Cloudy	Cloudy	W. S. W.
18	29.268	29.378	66.5	53	Fine, cloudy	Wind	Westerly
19	29.412	29.394	67.5	54	Fine, sun, clouds	Cloudy	S. W.
20	29.354	29.440	66.5	55	Cloudy		S. W.
21		29.736		52	Fine, clouds, sun		
22	29.802	29.854	72	52	Fine, all sun	Fine	Southerly
23	29.830	29.822	74	58	Hot sun		Calm, vble.
24	29.780	29.668	73	57	Hot sun		
25	29.644	29.686	71.5	58	Hazy, clouds and sun	Fine	N. E.
26	29.684	29.744	65		Fine, sun		E. N. E.
27	29.730	29.696	62.5	47.5	Fine, sun	Clouds & stars	Easterly
28	29.686	29.672	68	48.5	All sun, hazy	Fine	Light, vble.
29	29.656	29.644	74	53.5	Hot sun	Fine	Calm
30		29.620	71	55	Fr. brz., sun, cls. & hze	Fine	N. E.

Mean Max. 66.8 51.0 Mean Min.

JULY.

1837	Barometer.		Thermometer.		Remarks.		
July	Morn.	Even.	Max.	Min.	Day.	Night.	Wind.
1	29.838	29.824	63	48	Fine, sun	Cloudy, fine	Easterly
2	29.780	29.768	69	45	Fine	Fine	N. E.
3					Fine		Northerly
4	29.686		69	55	Hazy, hot sun	Fine	Northerly
5		29.614		55	Fine	Cloudy	Calm, Wrly.
6	29.660	29.718	71		Fine		Northerly
7		29.720	74	60	Hazy, hot	Fine	Calm, S.
8	29.706	29.702	75	59	Fine, hot	Fine	Easterly
9		29.546	65	53	Fresh breeze, sun	Fine	N. E.
10	29.462		70	46	Fine, sun	Fine	N. E.
11		29.472	72	52	Fine, sun	Fine	S. Easterly
12	29.458	29.362	69	53	Fine, sun	Fine	Variable, lgt.
13	29.290	29.260	72	58	Fine, sun	Light showers	Westerly
14		29.330	72	58	Wind, cool		
15	29.322	29.400	69	58	Fine, shower	Showers	Variable
16		29.550	68	52	Fine, sun		N. W.
17					Fine, and showers	Showers	Westerly
18	29.320	29.330	68	54	Fine, and showers	Showers	Westerly
19	29.328		71	52	Very fine	Showers	Westerly
20					Showers		
21		29.622	67		Hazy		Northerly
22	29.600	29.580	70	53	Fine, clouds, sun	Fine	Westerly
23	29.552	29.566	72	58	Fine	Showers	Westerly
24	29.616	29.618	70	58	Fine, showers	Light showers	W. N. W.
25	29.600	29.570	72	58	Fine, sun	Fine, stars	W. N. W.
26	29.544	29.526	72	58	Fine	Showers	CalmW.N.W.
27	29.462	29.290	73	58	Very fine		S. W.
28		29.118	71	58.5	Very fine		S. W.
29	28.654	28.704	64	55	Windy, showers	Heavy showers	S. W.
30	29.020	29.326	63	53	Clouds and sun	Rain	N. W.
31	29.390	29.340	66.5	50	Showers, clouds	Fine	S. W.

Mean Max. 69.5 54.5 Mean Min.

AUGUST.

1837	Barometer.		Thermometer.		Remarks.		
Aug.	Morn.	Even.	Max.	Min.	Day.	Night.	Wind.
1	29.234	29.200	60	52	Cloudy, damp, rain	Rain	Calm, E.
2	29.088	29.072	63	58	Heavy rain	Rain	S. W.
3	29.020	29.200	66	54	Heavy showers,	Showers, wndy	S. W.
4	29 354		63.5	51	Fine	Fine	Westerly
5		29 748	64	46	Clouds and sun		
6	29.784	29.860	64	48	Cloudy	Fine	Easterly
7	29.874	29.914	66.5	46	Clear, fine, sun	Fine	S. Easterly
8	29.914	29.840	66	46	Hot sun, fresh breeze	Fine, wind	N. E.
9	29.696	29.530	67	50	Fine, fresh breeze	Fine, wind	Easterly
10		29.440	73	52	Calm, fine	Light showers	Southerly
11	29.410			57	Sun, rain, clouds		Calm
12		29.480	70	56	Fine, clouds, sun		Westerly
13	29.644	29.704	72	53	Fine, clouds, sun		S. W.
14	29.780		70	56	Fine, hot sun	Fine	Southerly
15	29.806	29.802	72	57	Fine, hot sun	Fine	Northerly
16	29.696	29.610	73	54	Fine, sun, clouds	Fine	Easterly
17	29.584	29.582	72	59	Showers, thunder	Fine	Northerly
18	29.660	29.700	72	61.5	Sun, clouds, haze	Fine	Calm, N.
19	29.668	29.402	73	57.5	Fine, cloudy	Fine	
20	29.380	29.478	70	61	Cloudy	Shrs. & lightn.	S. W
21	29 434	29.578	69.5	56	Fine, wind, and rain	Fine	S. W.
22	29.660	29.630	65	53	Rain	Cloudy	
23	29.570		69	61	Rain in showers	Showers	Calm, E.
24	29.760	29.780	60	48.5	Clouds and sun	Heavy Rain	N. E.
25	29.735	29.560	65	48	Very fine	Clear aurora	S. E.
26	29.420	29.586	62	54	Litng. & th , hvy. rain	Clear	Calm
27	29.732		63	47	Fine	Clear, fine	
28	29.520		63		Fine, sun	Rain	S. W.
29	29.064	29.060	60	51	Clouds, calm, rain	Rain	S. W.
30	29.030	29.036		49	Clouds, light showers	Cloudy	Northerly
31	28 980	28.924	59	44	Heavy showers, cold	Fine	Southerly

Mean Max. 66.6 52.9 Mean Min.

DIVI BOTANICI;

SKETCHES OF BOTANISTS WHOSE NAMES ARE COMMEMORATED IN THE APPELLATIONS OF PLANTS.

Article the First.

Immortality of Fame as well as of Existence has ever been an object of intuitive aspiration in the Mind of Man; and it is this fondly cherished solicitude for attaining an everlasting celebrity that naturally assists in fostering motives to emulation in the exercise of his moral and intellectual powers.

With consciousness of possessing the innate sentiment which encourages an individual to hope that he himself may yet acquire an enduring reputation, or with the benevolent aim of strengthening in others the incentives to meritorious exertion, the Heads of Sects and the Rulers of Nations have usually displayed a generous promptitude to foster the desire of excellence by conferring the meed of a superlative glory on the wisest and the best of their adherents and compatriots, according to their estimate of worth and their judgment of dignity. Hence, from this source, erewhile arose the rite of Deification, whereby the primeval mythologists made gods of their sages and heroes; and, in after-times, with an object not essentially dissimilar, the process of producing saints began its course, and the work continues to be designated a Canonization. With a purer taste, however, and a sublimer gratitude, by devoting the names of discoverers to things discovered, the Naturalists create a more exalted renown for those enlightened Spirits who are fortunate in contributing to the advancement of their disinterested and truly philanthropical investigations.

Natural History includes many fair systems within its extensive domain: among the most fascinating of these, and the most innocent, is Botany: and the method of honouring the distinguished improvers of this divine Science, by appropriating their names to be appellations of Plants, is an object of virtuous competition, alike desirable as a reward of the excellencies it immortalizes, and venerable for the tendencies of its principle and the antiquity of its establishment.

Tradition associates with History in perpetuating the beneficence of those ancient Simplers who were thus rewarded for their success-

ful employment of the vegetable energies, as the means of healing injuries and diseases, in the days when Knowledge and Experience were but entering on their interminable career. With notes on the most remarkable of these illustrious personages, and on the salutary virtues of the herbs which are their emblems, an Introduction may be framed for the Sketches of Botanists whose names are commemorated in the appellations of Plants.

ARTEMISIA.—This celebrated female was the daughter of Hecatomnus, king of Caria, a country of Asia Minor, whose inhabitants, from their wealth and fortitude, were long distinguished as a very powerful nation, the metropolis of which was Halicarnassus, the birth-place of several philosophers renowned in the history of patriotic wisdom. Having conceived an ardent and sincere affection for her brother Mausolus, who was famous for his personal beauty, the princess afterwards became his wife, in conformity with the custom which sanctioned the union of brothers and sisters in marriage—a custom that necessarily obtained among the primitive occupiers of the earth, and thus was a chief cause from which the distinct Races of Men derived their origin.

Mausolus succeeded to his father's throne, and the prosperity of an industrious people made his reign fortunate, while his own happiness was enhanced by the purity of his queen's devoted attachment. But, like most other earth-born pleasures, this scene of comfort, though fair, was transitory. It closed with his death, which took place in the three hundred and fifty-third year before that wonderful event from which the Christian epoch dates its commencement. By this overwhelming bereavement, his widow was rendered forlorn and inconsolable; and, when his body had been consumed on a funeral pyre, she drank of his ashes suspended in a fluid potion. Resolving to erect an everlasting memorial to the name of her fondly bewailed husband, she engaged the emulation of learned men in promoting this aim of her conjugal piety, by the announcement of high and honourable rewards for the best elegiac eulogy on his character and attainments. In this strife of panegyric, the successful competitor was Theopompus of Chios: he acquired the reputation of an exact and eloquent historian; but, with the exception of some detached fragments, his compositions, including the pathetic funeral oration, have all perished from the records of literature. At the same time, and with the desire of preserving for ever from oblivion the object of Artemisia's affection, as well as the intensity of her own enduring sorrow for his dissolution, the widowed mourner constructed one of the grandest and noblest monuments of antiquity;

and, having designated it a *Mausoleum*, she consecrated the magnificent structure to his memory. It was a four-sided edifice, surmounted by a pyramid, having its summit adorned with a chariot and four horses; and, for ages, it was venerated as one of the wonders of the world.

Immediately on the demise of Mausolus, his munificent queen undertook the arduous offices of sovereignty; and, while thus discharging the duties of her high destiny, she displayed extraordinary wisdom, energy and patriotism, in promoting the welfare of her people, and in strengthening the resources of their country. But her spirit did not cease to be inly deadened by the gnawings of grief; and, in two years from the decease of her husband, she escaped from the cares of life and the fatal repinings of sorrow.

ARTEMISIA *the Plant.*—Considered as a generic term in Botany, the *Artemisia* comprises more than twenty species of vegetables, most of which are distinguished for their bitterness and strengthening properties. Five of these are indigenous to this Island, but good reasons may be found for believing that the common Mugwort was the plant which the Carian "queene adopted for her own herbe," and administered it, with beneficial effects, as a remedy for diseases, particularly for such as are incident to the female constitution. The restorative powers of this plant appear to have been ascertained at an early stage in the practice of applying natural remedies; but, during the lapse of ages, many extravagant representations of its virtues were made by fanciful and credulous prescribers for the cure of sickness and wounds.

Originally this herb seems to have been known under the name of *Parthenis*, the virgin-flower, with reference to its efficacy in female affections. Afterwards, however, when it had obtained its existing appellation, this was speculatively regarded, by certain of the botanical historians, as betokening the patronage of Diana who, as the goddess Artemis,* received the adoration of her Grecian vo-

* According to Pliny, the prince of naturalists, "not men only and great kings, but women also and queens, haue affected this kind of glory—*to giue names vnto herbes:* thus queen Artemisia, wife to Mausolus, king of Caria, eternized her owne name by adopting the herbe Mugwort to herselfe, calling it Artemisia, whereas before it was named Parthenis." Some there be who attribute this denomination vnto Diana, whom the Greeks called Artemis Ilithyia, because the plant is of speciall operation to cure maladies incident to women." He says, in another place, that "the Mugwort will preserue all those who haue it about them from witchcraft, sorcerie, and poison, from danger by venomous beasts, yea, and from the hurtfull and maligne aspect

taries. This notion may be set aside as gratuitous; but, whether the Plant derived its name from a deified maiden or a virtuous and enterprising matron, it might unquestionably be employed as an excellent medicinal agent, although now neglected, like many other valuable British vegetables, for no better apparent reason than the circumstance of its being readily obtainable and abundant.

CHIRON *the Centaur.*—When divested of the fantastic imagery under which he was mystically represented by the inventors of ethnic Mythology, this person appears as a munificent though unpolished patriarch among a pastoral people whom he essayed to benefit by the exercise of an acute natural sagacity, enlightened by high endowments of the perceptive and reflective powers. Having observed the salutary efficacy of a bitter herb upon the lower animals, he rightly inferred that it might determine equally favourable results in man. He instituted a trial, and the wisdom of his foredrawn conclusion has been established by experience, both various and manifold. His name ranks high in ancient story, for his skill in music, archery, medicine, astronomy, and most of the polite arts; and, in these departments of science, he liberally communicated in-

of the very sun. The same, if it be taken in wine, helpeth and saueth those that are poisoned with opium: being either drunk, or worn about the neck, or but tied to any part of the body, it hath a peculiar vertue against the venom of todes."—*Historia Naturalis*, lib. xxv, cap. vii, x; folio, Venetiis, 1469: also *The Natvral Historie of C. Plinivs*, by Philemon Holland, M.D., folio, London, 1634; vol. ii, p. 222, 231–2. Marvellous and manifold are the powers imputed to the Mugwort: a copious enumeration of them is exhibited in Dr. James's *Medicinal Dictionary*, under the plant's botanical name. Bartholomew Glanville, who composed his work about the middle of the fourteenth century, observes, with characteristic quaintness, that "Artemisia is called moder of herbes, and was sometyme halowed by men of nations to the goddesse Diana that hyght Arthemis in Grece, for that the goddesse founde out the vertuous therof and taughte theym to mankynde; it driueth away fendes and withstondeth euyl thoughtes, and abateth feete ache that cometh of trauaile of goynge."—Bartholomej Anglicj de *Proprietatibus Rerum*, libri xix; folio, Lugdunj, 1480; lib. xvii, cap. xvi: Bertholomeus de *Praprietatibus Rerum*, translated into English yy John de Trevisa; folio, London, 1535, p. 149. "To make a chylde mery, hange a bondell of Mugwort tagant, or make smoke thereof under the chylde's bedde, for it taketh away anoy for *(fro)* then. Agaynst payne of the heed called mygreyne or cephale, gyve some hot opiate in the decoccyon of Mugwert, and he that bereth it on hym in walkynge weryeth not. It is also good agaynst yll thoughtes, and stopeth the eyes that harmes, and all deuyllysshnesse fleeth fro the place where it is."—*The Grete Herball*, whych gyveth parfyt knowledge and vnderstandyng of all maner of Herbes; folio, London, 1529, cap. xxix.

struction to many eminent disciples ; but, beyond all the rest, Achilles, Hercules, Peleus, Jason, Aristæus, Theseus, Ulysses, Machaon, Podalirius, Æneas and Æsculapius, were the most illustrious.

Poetic history first recognizes the countrymen of Chiron as a tribe of herdsmen sojourning among the romantic uplands of Thessaly. By whatever name this people was designated in the Thessalian dialect, it has been immemorially known to the scholar skilled in Hellenic lore as a tribe of Centaurs* or *bull-prickers,* who hunted wild bulls on horseback, and tamed them to rural purposes, using *goads* as the instruments with which these powerful animals were subdued, and directed in the operations of pasturage and husbandry. Equally famous were this ingenious people and its chieftains for being the first to undertake the arduous enterprize of training war-horses and of managing them in battle, with terrible and destructive advantage over their antagonists. While they formed a new and distant object, the athletic Centauric archer and his steed would appear, to the fears or the fancies of alien tribes, as one prodigious animal; and, thus excited by amazement, the wild enthusiasm of Ideality in their painters, sculptors and poets, forthwith engendered the formidable Monster, *half-man half-horse,* which constituted an expressive mystification of the dexterity and courage that should justly elevate the Centaurs of Thessaly to the praiseworthy distinction of having been the earliest equestrian knights, the intrepid Fathers of Chivalry.

Chiron was styled the "*Herbipotent*" and "*Æacidæ Doctor,*" from his practical acquaintance with the properties of herbs, and his judgment in their administration ; for his love of justice and hospitality, he was revered as "*Senex Observatissimus Æqui,*" the most upright and generous of his cloud-begotten† kindred : and, after his death, from a wound accidentally inflicted by a poisoned arrow, his proficiency in the astronomical mysteries was gratefully acknowledged by his translation into one of the zodiacal signs, in the figure

* Centaurs, Κένταυροι, so named παρὰ τὸ κεντεῖν τοὺς ταύρους from their practice of pricking or goading bulls when training them for labour, or managing them on their pasture-grounds. They were worsted, in a drunken squabble, by the Lapithæ, a clan of their countrymen ; and, having insulted Hercules, they were exterminated by that hero as he was going to hunt the Erymanthian Boar.

† Nephele means a *cloud,* literally : it was a mountain of Thessaly, where the Centaurs resided; and, being an upland pastoral region, it was often enveloped in clouds. Hence, from this natural feature of the climate, the Fable was fabricated—that the Centaurs were the progeny of Ixion by Juno, who admitted his embraces under the form of a cloud !

of a centaur, as *Sagittarius*—the bowman. Many of the Grecian states instituted divine honours to his memory; the Magnesians adored him with peculiar rites; and Hesiod composed an ode in praise of Chiron, the benefactor of mankind.

CHIRONIA *Centaurium the Plant.*—Here, the most instructed Man among the first men of a regenerated world, and the instructor of Men immortalized in the annals of primeval nations, Chiron the Centaur retains a two-fold tribute of veneration from being held in honourable remembrance by the *generic* and *specific* names of an Herb whose useful qualities have long been extensively recognized. This herb is the Common Centaury, the "*Sanctuairie*" of those simpling curers who make it efficacious, in a stomachic tea, for reviving the exhausted energies of digestion. Nature is bountiful in providing an abundance of native remedies in every habitable region of the globe, and in adapting them to the necessities of its inhabitants.

From the strength of the Bitter Principle which imbues it, the Centaury acts as a mild tonic medicine, producing favourable results in cases of debility or derangement of the functions of nutrition, and in some feverish affections. It also promotes the expulsion of worms from the bowels, and it has entered as an active ingredient into certain fashionable compositions for preventing or moderating attacks of the gout* in persons who are predisposed, by descent or habit, to suffer fits of this inveterate disease. Were the facts furnished by popular experience to receive the attention due to its value as a conservative of health, this well-approved Bitter would supersede most of the more expensive, but less efficient, drugs of the same kind, whose chief importance accrues from their exotic growth.

* Centaury forms the basis of the celebrated Portland Gout Powder, but in this state it should neither be taken in large doses, nor continued through a lengthened course. "Centauria is a ryghte bytter herbe, and hight, therfore, the gall of the erthe; for one that hight *Achironecentaurus* founde and knewe fyrste the vertue therof."—Glanville. "Centorie was called in Greeke *Centaurion* and *Chironion*, after the name of Chiron the Centaure, who first of all founde out the herbe and taughte it to Æsculapius. The decoction of Centorie the lesse dronken, killeth wormes and driueth them foorth by siege. The small Centorie greene, pounde and layde to, doth cure and heale freshe and newe woundes, and closeth up and sodereth olde malignant vlcers that are harde to cure."—Lyte's *Nievve Herball*; folio, London, 1578, p. 327. "The drynke that Centory is soden in, with sugre to delaye the bytternesse, is good agaynst opylacyon, or stoppynge of the lyver, of the mylt, of the reynes, and of bladder."—*Grete Herball.*

Nowadays, although it had obtained for centuries, the Chironia has been transformed, by the spirit of neological glossography, into an *Erythræa*, the *redling*, for reasons the propriety of which is unapparent. Many are the red-blossomed vegetables that make more conspicuous *Redlings* than the plant which has ever been held in hallowed estimation as the Herb of Chiron, since the days of old.

MELAMPUS.—Thirty-three centuries and more have completed their irremeable courses since the times when Melampus "*the Prophet*" overawed and benefited the early Peloponnesian tribes with wonders produced by the applications of his skill in moral and medicinal knowledge. Like the kings, priests and physicians of his days, he was a shepherd, and employed the leisure afforded by a pastoral life in pondering the system of terrestrial nature, and in contemplating the sublime economy of the "Host of Heaven." While thus devoted to the noblest intellectual exercises, favoured by seclusion and tranquillity, he regained that of the patriarchal wisdom by what he was qualified to sustain, the venerated character of a sage and a seer, and to secure for his name a glorious homage in the gratitude of after-generations.

This extraordinary personage appears, in ancient history, as the son of Amythaon the son of Cretheus, who was king of Iolchos at the period when Moses began to "keep the flock of Jethro his father-in-law," amid the mountains of the Arabian wilderness. Represented allegorically, Melampus had his dwelling-place at Pylos; and, while residing there, a knowledge of Poetry and Augury was imparted to him by the Divinity, through the instrumentality of serpents.* He descanted pathetically, in harmonious numbers,† on

* According to the apologue, Melampus had his ears gently licked by two serpents, while he was asleep during his infancy; and, by means of this mystical process, he received the gift of prophesying and that of interpreting the "language of birds." This allegorical legend originated in the widely prevailing belief, that these reptiles, which "were more subtle than any beasts of the field," possessed the faculty of presaging the atmospheric changes and the accessions of epidemical maladies. Hence it came, that the men of Argos revered the serpentine race as the "natural masters of the divinatory science," and never suffered one of them to be destroyed.

† Melampus was one of those primeval Melodists, whose names have survived "the wreck of ages and the spoils of time:" the "divine" Homer remembers him with marks of approbation. He composed many thousand verses on the *Sorrows of Ceres*, on the *Eleusinian Mysteries*, and on other themes; but all these have disappeared from the records of human action. From Apollo he derived an unequalled insight into the secrets of Physick; and, among the fooleries of modern "phisiognomers," there is a tract of

the lamentations of Ceres over the adventure of her daughter Proserpine, who was "rapped" by Pluto from the beautiful plain of Enna, while botanizing there with her attendant nymphs; and, by the institution of didactic rules, the Pylian sage instructed his disciples in the art of prognosticating the issues of disease, and of making their treatment prosperous.

Melampus retains the undisputed honour of having been the first to prescribe a mineral remedy, and to treat with perfect success that mode of "Melancholy without Fever" which is now designated Monomania or partial insanity whereby, from its insidiousness, the purest filial, parental or conjugal affection, too often has been inconsciously destroyed. He was no adept in the trade of "sending out the draughts;" but, notwithstanding this happy ignorance, he had discovered the value of so disguising natural means with a veil of mystery as to procure for them the co-efficiency of a superstitious reliance on their powers. His "method of treatment" is exemplified in the "case" of Iphiclus, a Phylacian prince. With a view to this end, he made the sacrifice of two bulls his preparatory operation; and, having divided their entrails into right portions, he congregated the birds, in order to execute an augury. Among the rest came a Vulture, and its omened flight revealed to the diviner that on a long-past occasion, when immolating an oblation of rams, the prince's father laid down the sacrificial knife near his son who, being yet a boy, beheld the weapon with dread, and hastened to deposit it in the cleft of a consecrated Chestnut-tree, where it became inclosed by successive layers of the bark; and that, on the knife being reproduced and the rust* collected from its blade, if the invalid should drink of this in wine for ten days together, his acquisition of the desired energy would be certain. Iphiclus delayed not to enter on the course prescribed for him; and, in due time, he was enabled to rejoice in the possession of vigorous manhood.

his on congenital discolourations of the skin, which is altogether spurious —the fiction of a delusive imagination. This piece, which nevertheless is a curiosity, has been several times printed both in Greek and Latin. It was translated into English by Thomas Hylle, and is appended to his "Contemplation of Mankinde," with the title "A Treatise of the Signification of Moles, seene in any part of man or woman, written by a Greeke Autor named Melampus;" 12mo., London, 1571.

* This is the first recorded instance of the carbonate *(sesquioxide)* of iron being exhibited as a tonic medicine. To this day, it continues to maintain its celebrity as a remedy for nervous disorders and debility. In the case of Iphiclus, the wine would co-operate with the iron, and facilitate the efficacy of its invigorating virtues.

Prœtus held the sovereignty of Argos at the time when the Poet of Pylos was meriting an immortal eminence among the neighbouring nations, by his manifold endeavours to mitigate the sufferings and to enlarge the comforts of mankind, through the influences of beneficence and wisdom. This prince had three daughters, who were affected with an inveterate cutaneous eruption ;* and, on its being accidentally, repelled the disease took a determination to the brain, and so deranged its functions as to induce a partial insanity.† Affected thus by a strong mental delusion, the princesses entertained the monstrous fancy that they themselves were *Cows ;* and, escaping from society, they scampered away to the woodlands, where they filled the plains and forests with their wild lowings and their cries.

Melampus undertook the cure of these delirious damsels ; and, for this purpose, he began with administering Black Hellebore,‡ as the best means, in his mind, for purging the bowels and the brain. He then subjected them to violent and protracted exercise,§ with

* Hesiod describes the affection of the Argian princesses by symptoms which distinctly indicate a case of leprosy. In them, he says, the head was covered with disgusting scabs, which caused an intolerable itching ; the hair fell off in various places, producing patches of baldness ; and over all their persons the skin was covered with lentil-shaped blains.—Eustathii, *Schol. in Odyss.*, v, p. 1746 ; folio, Romæ, 1549.

† When Hercules was absent, at the performance of his labours, his wife Megara sustained an attack of personal violence by Lycus a Theban exile ; and the matron must have been overpowered in the outrage if her husband had not returned at the moment, and punished the ravisher with death. This dreadful occurrence rendered Hercules so delirious that he killed his three children and their mother in a fit of madness, thinking them to be wild beasts. Another illustration of partial insanity results from the facts in this episode of the hero's history. This affection is prone to become infectious ; sometimes it spreads epidemically among women having a sensitive and nervous constitution.

‡ Blacke Hellebor, taken inwardly, prouoketh the siege or stoole vehemently, and purgeth the neather part of the belly from grosse and thicke fleme and cholerique humours : also it is good for them that waxe mad or fall beside themselues, and for such as be dull, heauy, and melancholique.—Lyte's *Nievve Herball*, p. 352. With Helleborum is a Watyr made that restoreth youth : such a one saw I my father haue : but such watyrs vexe the bodyes, and make a fallible image of youth.—Peter Morwyng's *Treasvre of Evonymvs*, p. 176, 4to ; London, 1559.

§ Melampus has the credit of attaining this object by a contrivance which has probably never been imitated. He sent a number of robust boys who, by jumping and shouting, frightened the princesses and chased them as far as Sicyon, a distance of three leagues—a manœuvre well-calculated to re-

the effect of determining a profuse perspiration: and, last of all, to complete their recovery, he enjoined a course of bathing in the Thessalian fountain,* whose waters were long held in high estimation for their property of removing the scurfy, leprous and other sordid impurities of the skin. By this process of salutary discipline, the frantic maidens regained their health and equanimity; and the "doctor's honorarium" was the fairest of his fair patients, with a fair inheritance in her father's kingdom.

MELAMPODIUM *the Plant.*—Anciently this herb had the name Hellebore, expressive of its deleterious qualities on being inordinately employed. When the daughters of Prœtus were delivered from their melancholy delusions by the agency of its evacuating energies, the name of their benefactor was bestowed upon the plant, as a tribute of grateful respect from the herbarists for his discernment and humanity. It continued for many ages after that event to be recognized as the *Melampodium*;† but, for reasons which satisfied Linnæus, the term now distinguishes a genus of exotic vegetables having characters every way dissimilar. The plant administered by Melampus was the *Black Hellebore* whose root, according to its proportions, has immemorially been regarded as capable of acting beneficially in dropsical, asthmatic, hysterical, epileptic, maniacal, and other nervous maladies, when these are unattended with fever, debility, inflammation or spitting of blood.

Pliny expatiates with amusing minuteness on the *Melampodium*,‡ giving an enumeration of its names, kinds, habitats and uses, both mystical and medicinal. Speaking through an English version, the naturalist commences with the inquiry "Who hath not heard of Melampus, the famous diviner and prophet? He it was of whom one of the Hellebores tooke the name, and was called Melampodion. And yet some there be who attribute the finding of that herb vnto

open the cutaneous pores, and thus to withdraw the causes of insanity from the brain.

* This was the source of the river Anigrus, to whose springs the qualities of a mineral water are ascribed. The Centaurs washed with it the wounds they received from the arrows of Hercules, in the reckless broil which led to the loss of Chiron's exemplary life.

† It was also called *Eutemon* and *Polyrrhizon*, sometimes *Veratrum*, but this last term generally denoted the *white* hellebore; and it is worthy of remark that the *Veratria*, a modern vegetable alkali, prepared from this plant, has precisely the same virtues attributed to it as those which were found to exist in the herb itself, according to the earliest records of the healing art.

‡ *Natural Historie of the World*, Tombe ii, p. 217–20.

a shepheard* or heardsman of that name, who, obseruing well that his she-goats feeding thereupon fell a scouring, gaue their milk vnto the daughters of king Prœtus, whereby they were cured of their furious melancholy, and brought again to their right wits. The black Ellebore is a very poison to horses, kine, oxen, and swine, for it killeth them; and therefore naturally these beasts beware how they eat it. It commeth up euery where, but the best is in Helicon, a mountaine much renowned and praised for other herbs beside it, wherewith it is well furnished. The *blacke* Ellebore is called *Melampodium*, wherewith folk vse to hallow their houses for to driue away ill spirits, by strewing or perfuming the same, and vsing a solemne praier withall: it serueth also to blesse their cattell after the same order. But for these purposes they gather it uery deuoutly, and with certain ceremonies:† for, first and foremost, they

* Although the grandson of a king, Melampus was a shepherd and herdsman, superintending the management of his flocks and herds in person, as did Abraham, Lot, Laban, Isaac, his sons and grandsons, whose trade had been with cattle from their youth, both they and also their fathers.

† According to the same industrious collector, nearly similar observances were practised by the Celtic Druids, in preparing the Selago, Samolus, Vervain and Mistleto, for religious and salutary purposes. "Many ceremonies," he says, "are to be obserued in the gathering of this herbe, Selago (*Lycopodium Selago*, wolf's-foot, wolf's-claw, fir-leaved club-moss), which is much like unto Sauine. The party who is to gather it must be apparelled all in white; go barefoot he must, and have his feet washed in fair water. Before he commeth to gather it he ought to do sacrifice unto the gods, with bread and wine: moreouer no knife or yron toole is to be vsed hereabout; neither will any hand serue but the right, and that also must do the deed not bare and naked, but by some skirt or lappet of his coat between, which was done off with the left hand, and so closely, besides, as if he came to steal it away secretly. Last of all, when it is gathered, wrapped up it must be, and carried in a new linnen napkin or towell. The Druids of France haue a great opinion of this herbe thus gathered, and haue prescribed it to be kept, as the only preseruative against all hurtfull accidents and misfortunes whatsoever; saying that the fume thereof is singular good for all the infirmities and diseases of the eies. The Druids also make great account of another herb growing in moist grounds, which they name Samolus (*Samolus Valerandi*, round-leaved water-pimpernel, or brook-weed); and forsooth if you did well you should gather it fasting, with the left hand in any wise; and in gathering not look back howsoeuer you do. In Gaule the Druids vse the Vervaine (*Verbena officinalis*, vervain, simpler's joy) in casting lots, telling fortunes, and foresheuing future events by way of prophesie. They giue expresse order that it be gathered about the rising of the great dog-star, but so as neither sun nor moon be at that time aboue the earth to see it; with this especial charge besides, that before they take up the herbe they bestow upon the ground where it groweth, honey with the combes, in token of satisfac-

make a round circle about it with a sword or knife, before they go in hand to take it forth of the ground: then the party who is to cut or dig it vp turneth his face into the east, with an humble prayer vnto the gods, *That they would vouchsafe to give him leaue, with their fauor, to do the deed;* and with that he markes and obserueth the flight of the Egle; for lightly while they be cutting vp of this root, ye shall see an Egle soring in the aire: now in case the said Egle flie neere vnto him or her that is cutting vp Ellebore, it is a certain presage and foretoken that he or she shall surely die before that yeare go about. It is wel known that Carneades the philosopher, purposing to answer the bookes of Zeno, prepared his wits and quickened his spirits by purging his head with Ellebore; and Drusus, one of the most famous and renowned tribunes of the commons that were ever knowne at Rome, was perfectly cured of the falling sickness by this only medicine. It is good for the palsie, for those that be lunatick and bestraught of their wits, for such as be in a dropsie so they be cleare of a feuer, for inueterat gouts, as well of feet and hands as other joints. Physitians forbid the giuing of Ellebore vnto old folk and yong children, to such as be of a fœminine bodie; as also to those that be in mind effœminate; likewise to those who are thin and slender, soft and tender; least of all vnto those that spit or reach up blood; no more than to sickly

tion and amends for the wrong and violence done in depriuing her of so worthie an hearbe. They inioine them also who are to dig it vp, for to make a circle round about the place with some instrument of yron, and then to draw and pluck it vp with the left hand in any wise, and so to fling it aloft ouer their heads vp into the aire: which done, they appoint precisely that it be dried in the shadè, leaues, stalkes, and roots, euerie one apart by themselues. They add, moreouer, that if the halle or dining-chamber be sprinckled with the water wherein Veruaine lay steeped, all that sit at the table shall be very pleasant, and make merrie more jocundlie. Of all other hearbes, there is none more honoured among the Romans than Hierobotane (the sacred plant, Vervain), called in Greek Peristerion, but which in Latin we name Verbenaca: it is that hearbe which our Embassadors vse to carry with them when they go to denounce war, and to giue defiance vnto our enemies. With this hearbe the feastivall table of Jupiter is wont to be swept and clensed with great solemnitie; our houses also be rubbed and hallowed for to driue away ill spirits.. Concerning the Misselto (*Viscum Album*, missel, all-heal), the principall and best is found upon the Oke; it will work the better and with more efficacie in case it be gathered from the Oke the first day of the new moon; also if it be not cut downe with any bill, hooke, knife, or edged yron toole. Moreover they do hold that, if it touch not the ground, it cureth those who are troubled with the falling sickness."—*Natvral Historie*, ii, 178, 193, 228.

and crasie persons who haue some tedious and lingring maladie hanging vpon them." Here is a selection from the curious and instructive notes of Pliny in his natural history of the *Melampodium*, as it was esteemed for a medicine by the ancients. He shows very clearly that, from observation and experience, the fathers of primitive families possessed much information concerning the nature and virtues of herbs; and, with many evidences, he also shows how soon the first tribes, misled by their patriarchs, degenerated from the simple worship of Him who created the Universe, while they brought debasement on the higher elements of Mind by the institution of fantastic and mystical rites as excitements to a spurious devotion. So prone is Man to invent superstitious observances, through a misuse of the intuitive sentiment that naturally disposes him to be religious.

TEUCER.—Legendary tradition prefers some claims to consistency when it uniformly selects the reputed disciples of Chiron the Centaur from among the cotemporary chieftains, notwithstanding the simple personal history of these unforgotten naturalists is densely encumbered with the ornaments of mythological and allegorical poetry. Like the rest, Teucer was fortunate in having "the wise and just man of Æmonia" for his instructor; and, profiting by the Centaur's precepts, he acquired a predilection for the exercise of his observant faculties in the examination of vegetable productions, so as to make them applicable to useful ends. With his parents, originated one of the first causes, and he himself was a high-spirited promoter, of that disastrous struggle which, "in the olden time," involved so many nations in misery, and occasioned so many heroes to be sacrificed at War's ensanguined shrine—the siege and extinction of Troy.

Teucer was the son of Telamon king of Salamis,* an island in the Ægean sea, with a capital bearing the same name. His mother was Hesione, the daughter of Laomedon king of Troy, whose faithlessness and ingratitude led to the first overthrow of that ill-fated city. He built its walls, and made vows with his supplications for divine assistance in the undertaking; but, when the work was completed, he stubbornly abstained from performing fairly his solemn

* Colouri is the modern name of this island, so famous for one of the most eventful naval conflicts recorded in ancient history. Ajax *Telamon* and his half-brother Teucer, who earned the highest reputation for valour and enterprize in the last Trojan war, were the sons of its sovereign. It lies opposite the southern coast of Attica, from which it is only a few miles distant: it is about fifty miles in circumference.

acknowledgment of the help he had received from heaven. For this impiety, his territories were laid waste by inundations of the sea, and his people suffered grievously from an epidemical pestilence. Penitential sacrifices were then ostentatiously offered by the royal transgressor; but, like the constrained abasements too often displayed by a justly chastised hypocrisy, they added mockery to the guilt of perfidiousness: they proved unavailing, and the calamities of his devoted nation increased. He was overmastered by the forces of an assailant* from the ocean, who demanded the annual tribute of a marriageable virgin, as the evidence of her people's subjugation to his power. For several years, this odious exaction had been endured, when the lot determined that Hesione, the king's daughter, should be the next victim. This fatal decision overwhelmed her hapless parent with consternation and wretchedness; and while with a natural reluctance he was hesitating to resign his tenderly beloved child to a destiny so cruel, he accepted the proffered aid of Hercules to liberate her country, and to punish its inexorable oppressor, engaging to recompense her deliverer with a stipulated number of the finest Trojan horses. Without delay the lady's heroic champion fulfilled his engagements, by achieving the monster's destruction; but, with the infatuation of a deceiver foredoomed to ruin, the false-hearted father refused to observe his part of the solemn compact, by withholding from his chivalrous ally the meed so entirely due to the saviour of his people from an intolerable degradation. Incensed most reasonably by the king's baseness, the ill-requited hero enforced his rightful claims by turning his power against the Trojan city which he captured, on the discomfiture of its army. He then put the insincere monarch to death, and established his son Priam on the dishonoured throne; and, having gained the princess Hesione among the spoils of war, he bestowed her on Telamon his trusty associate, who made her his queen, to share with himself the homage of his faithful Salaminian islanders.

Priam entered, with persevering energy, on the restoration of the Trojan metropolis, and he soon made it the admiration of many nations, for its extraordinary strength and beauty. But his prosperity

* With the poets this savage enslaver of the Laomedontiadæ is mystically pourtrayed under the symbol of a sea-monster, by whom the destined Trojan maidens were mercilessly devoured. When divested of his emblematic horrors, this monster would be a barbarian pirate or "reafere," like the brutal Scandinavian "Se-kingr," who were long formidable to islanders and dwellers on the sea-shore, from the sternness of their valour and the ferocity of their vengeance.

proved unfavourable to his virtue, by undermining its supremacy in the economy of mind: it betrayed him into an attempt at injustice and ingratitude. His pride reminded him that his sister had been given to a hostile stranger, by the man who had desolated the inheritance of his fathers, and massacred the chiefs of its kingly race. Excited inly by this ungenerous feeling, he conceived a desire to re-demand the princess from her husband, with disregard of her affection for her children and their sire; and, with a senseless unconcern about consequences, he dispatched his son Paris with a fleet so powerful as to render certain the indulgence of a solicitude alike unwise and unholy. This effeminate adventurer was kindly received by the Grecian princes; but, encouraging an hereditary disposition to selfishness and profligacy, and neglecting the injunctions he was commissioned to execute, he did not perceive depravity in subverting the happiness of his august entertainer by an outrage on the rights of hospitality, which are sacred even among savages, on the laws of moral intuition, which are divine and immutable. By a stealthy crime he perpetrated the "Rape of Helen," which kindled the flames of a pitiless warfare; and, in this, it was the hard fate of Teucer, the son of a Trojan princess, to have his prudence and fortitude exerted for the extermination of a people over whom his progenitors had long exercised a splendid and patriotic sovereignty.

When Teucer returned to Salamis from the Trojan expedition, his father would not receive him into his court and family, for the reason that the prince had not avenged the death of his half-brother Ajax,* who was killed in battle. In consequence of this unkindness, he repaired to Cyprus† where, on acquiring wealth and influence, he built a town, and conferred on it the name of his native island. After the death of Telamon his father, Teucer essayed to

* When Achilles was slain, Ajax and Ulysses supported opposing claims for the hero's arms; and, on the dispute being submitted to the decision of Menelaus and Agamemnon, the pretensions of Ulysses were preferred. By this award, the son of Telamon was so enraged that he fell into a fit of maniacal fury; and, during the paroxysm, he slaughtered a whole flock of sheep, imagining them to be the arbiters who had given him a position of gallantry inferior to that of his rival. This scene affords a melancholy illustration of partial madness occasioned by that disturbance among the mental faculties which awakens the passions of anger and pride.

† After the descendants of Teucer had continued to govern the Cyprian Salamis, and to guard the peace and prosperity of its inhabitants for more than eight hundred years, the town was destroyed by an earthquake. It was rebuilt and named Constantia in the fourth century.

vindicate his birth-right and to gain the throne; but, on finding that his attempt would be ineffectual, he retired to his Cyprian Salamis, and there ended a life full darkly checkered with adventure and peril.

TEUCRIUM *the Plant.*—This herb's name prolongs the distinction of Teucer, as an honoured and original distributer of remedies which depend on the virtues of this vegetable for their effects. Recently arranged systems of Botany make the term represent a family of shrubs, under-shrubs and herbs; and in this many kinds are included. Few of these grow spontaneously in this island; they are the Germanders* and Wood-sages, to which the Ground-pine is an intimate ally. If Teucer took his medicines from plants comprised in this family, they would act as cordial and bitter restoratives adapted to the cases of persons suffering from loss of appetite, weakened digestion, nervousness and rheumatic gout. Sage-germander or Wood-sage possesses the bitterness, and has much of the flavour, of hops: it is sometimes used in brewing, and is not unwholesome; but it imparts too dark a colour to the liquor. When, from necessity or accident, the Water-germander has been eaten by cows, their milk acquires the odour of garlick.

Although, in these latter days, the Teucrium denotes extensively the group of plants above-mentioned, yet the fitness of its application may be questioned, at least with respect to its originality. Pliny particularizes the herb which had its name in honour of the Prince of Salamis under the subsequent description; and therefore, this being faithful, the evidence is conclusive that the naturalist speaks not of a Sage or a Germander. He says,† "In the same age wherein Achilles liued, prince Teucer also gaue the first name and

* All the sorts of plants comprehended vnder the title of *Teucrium*, are doubtlesse kindes of Germander. They are not altogether without force or power to open and clense: they may be counted among the number of them that do open the liuer and spleen: when boiled in water and drunk, they deliuer the bodie from all obstructions and stoppings. There be Empiricks or blind practitioners of this age, who teach that with this herbe, *Asplenium*, *Ceterach*, or *Spleenwort*, not onely the hardnesse and swelling of the spleene, but all infirmities of the liuer also may be effectually and in a short time remooued, insomuch that the sodden liuer of a beast is restored to his former constitution againe, *that is*, made like vnto a raw liuer, if it be boyled againe with this herbe: but this is to be reckoned among the old wiues fables.—*Gerarde's Herball, or Generall Historie of Plants*, p. 657, 1141; folio, London, 1633. All this is a servile transcription from *Lyte's Nievve Herball*, p. 25, 113, and 408, with exception of the concluding judgment.

† Holland's *Natvral Historie of C. Plinivs*, ii., 216.

credit to one speciall herb, called after him Teucrion, which some nominat Hemionium. This plant putteth forth little stalks in maner of rushes or bents, and spreadeth low: the leaues be small: it loueth to grow in rough and vntoiled places: a hard and vnpleesant sauor it hath in tast: it neuer floureth, and seed it hath none. Soueraigne it is for the swolne and hard spleene: the knowledge of which property came by this occasion, as it is credibly and constantly reported. It fortuned on a time, when the inwards of a beast killed for sacrifice were cast vpon the ground where this herb grew, it took hold of the spleen or milt, and claue fast vnto it, so as in the end it was seen to haue consumed and wasted it cleane: herevpon some there be that call it Splenion,* or spleen-wort: and there goeth a common speech of it, that if swine doe eat the root of this herbe they shall be found without a milt when they are opened. Some there be who take for Teucrium, and by that name do call, another herb full of branches in maner of hyssop, leafed like vnto beans; and they giue order that it should be gathered whiles it is in floure, as if they made no doubt but that it would floure."

Teucrium is neither mentioned nor described by Theophrastus, who was the friend of Aristotle, succeeded Socrates in teaching philosophy, and composed his *History of Plants* almost nine hundred years after Teucer had retired to the peaceful government of his Cyprian territory. In his days, therefore, this herb apparently had not yet become known to botanists by the name that honours its discoverer. Dioscorides flourished more than nine centuries after Theophrastus, and his *Books on the Materia Medica* bear a date an-

* This is retained as a generic term in the nomenclature of modern botany, with a slight but improving variation. It is the Asplenium or *miltwaste*, so designated with allusion to its reputed properties. Vitruvius describes the origin of the name in these terms; and, though founded on a fable, his deduction is instructive. "That we are beholden to the soil," he says, "for the wholesomeness of provisions both for man and beast, is demonstrable from the lands of the Cretans, which lie along the river Pothereus: sheep and black cattle graze on the right and left of this stream; but those which feed on the one side are not without a spleen, while those that pasture on the other side have no appearance of any. Hence physicians were led to investigate into the cause of this phenomenon; and they discovered an herb which the cattle had eaten, and which, by its virtue, had wasted away their spleen. They gathered this herb, and used it to very good purpose in disorders of the spleen. For this reason the Cretans called it Asplenion. Now," he concludes, "this example shews us that the natural salubrity or insalubrity of a place may be ascertained from the vegetables and water it affords."—*De Architecturâ*, lib. i, cap. 4; folio, Amstelodami, 1649.

terior to that of Pliny's *Natural History;* but, during a part of their lives, these venerable Naturalists were cotemporaries. Each of them recognizes Teucrium as the established appellation of a plant which their predecessors had delineated, and also administered as a medicine. Very little difference occurs in their accounts of its characters and properties: of the two, the Greek physician discourses on his subject with the greatest brevity. His vegetable is not obscurely made a *Germander:* with Pliny, as has been noted previously, it is either a Germander or a *Spleenwort:* he abstains from proposing a distinction between them, as if his own views had been undetermined. Even through the veil of this uncertainty, however, the fact may be discerned, that an efficacious wild vegetable has been valued as the Herb of Teucer for more than three thousand years; and it is a good taste whereby that Exquisite Sagacity which affects to know all things, and would reform every thing, has hitherto been restrained from out-stretching its desecrating hands to eradicate from the rolls of phytological glossography the name of an herb whereby the student of Nature's excellencies is reminded that the Son of Telamon was endowed with a disposition to promote the advances of humanity and intelligence.

A GENERAL VIEW OF THE SUBJECTS OF NATURAL HISTORY.*

In commencing this Lecture, which is to include "A General View of the Subjects of Natural History," I may remark that Nature is a term comprehending all that exists so as to be perceptible by the human senses, without being planned by human contrivance or executed by human labour; and in this its general meaning Nature stands opposed to Art.

The lessons of Nature abound every where: they come to us in the beams of the sun, in the cloud, and in the shower; the ground we tread upon, the sky, the ocean, and the gentle air which fans the cheek, are all pregnant with instruction. Before any addition can be made to the accommodation or comfort of mankind, we must go

* Being a Lecture delivered before the Worcestershire Natural History Society, on the 3rd of October, 1837, by W. Addison, Esq., F.L.S.

to Nature for the materials, and to a knowledge of Nature for the methods of using them. All the most masterly combinations of the painter and the sculptor are but selections from the vast field of natural products. If he succeed in bringing together such an assemblage as no individual was ever known to exhibit, yet must the selection, in all its parts, follow the great outline and manner of Nature, otherwise, instead of a Venus or an Apollo, he would embody a monster.

Were I to bring before you any work of art in which genius had done its utmost, I could only shew you that the most perfect specimen of human ingenuity is but a faint and imperfect reflection of Divine Wisdom. The highest and noblest inventions of man can never stand the test of a comparison with the works emanating from the source of perfection. No parallel ought to be attempted between the works of Nature and the works of man. What are pyramids, that chronicle scarcely less than forty centuries, to your own neighbouring hills? What the most brilliant tints of the palette to the colours of the rainbow or the varied tints of autumn? What are the mausoleums of the east to the rocks and mountains that preserve the remains and memory of an extinguished world?

The works of Nature are so many and so varied—they include objects so beautiful and exquisite in their structure, and so perfect in all their adaptations—they are based upon principles so simple, yet so powerful, efficient alike upon the atom and the mass, now determining the orbits of comets and the career of planets through space to which we can assign no bounds, and again giving colour to the rainbow and the flower. The vast extension of Natural History, and its endless application to the wants of man, raises it so high in the scale of our inquiries and pursuits, that every attempt to impart its facts and conclusions in an easy and persuasive form is desirable and praiseworthy. To this end the building in which I am speaking, placed in the centre of your city, has been devoted; for this purpose its museum is stored with materials of interest, which cannot fail of imparting a feeling of surprise and admiration to those who visit them. Do not be disappointed if you cannot make out the object or uses of all you see; to understand any department a previous acquaintance with the labours of others is necessary. The energy of many minds has been exerted in the study of Natural History; and the limits of former discovery should be the starting-post for you.

Among the primary elements of education is the acquirement of the art of imparting to others all that may be passing in our own

minds, our thoughts, our wishes, and our wants. The organs of speech are limited to personal communications; they cannot convey our ideas to persons at a distance from us, much less are they able to transmit them to those who may come after us. But man has succeeded in establishing a permanent channel of communication. I take up my pen, and in a few minutes can exhibit in intelligible characters to all around me every thing that has been passing in my mind. The results of years of laborious research, of long and wearying thought, can at once be placed before thousands by the press. Thus every new view—every new discovery in Natural History—every inquiry that has occupied the attention of a life—is submitted to the world, where it is canvassed, verified, or corrected. Cotemporaries and posterity, instead of recommencing the investigation, begin where it terminated; every step is secured, and the thoughts and actions of a man's life, become beacons for the guidance of his successors. Without these means a knowledge of the various productions of Nature could not have extended far; as it is, they have given a vast impulse to the study in this country: to the publications in France, and to those of the immortal Cuvier especially belong the credit of this impulse in the departments of recent and fossil Zoology.

It does not fall within the scope of the present lecture to enter into the details of Natural History; but I shall endeavour to bring before you the primary divisions of the subject, and to exhibit some of the interesting objects they severally embrace.

At the head of animated beings stands man. Observe him in his social and in his uncivilized state: mark the effects produced by the activity of his reasoning powers; his habits from infancy inclining him to look to others of his species for his pleasures, consolation, and support; thus impressing on his character the feelings of parental love and the desire for social intercourse. His passions tempered by civilization: and the curious contemplations of an aspiring intellect subdued and harmonized by religion. From man turn your attention to the several tribes of animals with habits and instincts often superior to his own, with senses in no way inferior; capable of enjoyment, of attachment, and dislikes; sensible to pleasure and amenable to pain; but devoid of those intellectual powers which add the delights of contemplation and hope to the love of life.

From quadrupeds pursue the stream of vitality through birds of every size and every hue, from the Eagle soaring above the tops of the mountains, and the gigantic Crane stalking upon the arid plains of India, to the Humming-bird fluttering from flower to flower, sip-

ping their sweets; from the Vulture to the gentle Wren. Between these extremes, what beauty in form and plumage! What variety in song and habits! The air is often filled with the warbling tribe; the groves and thickets on every side resound with their notes of joy and affection.

The waters, again, are full of activity. The ocean teems with life: fish of every kind—the Whale, the Lobster, and the Shrimp. Every reef is bristling with corals and sponges, and every tide-washed rock is carpetted with fuci, or studded with *Actiniæ* and *Molluscs*. Then, again, the insect tribe, with their wonderful metamorphoses. From insects, the simpler forms of animal life are found in *Worms*, *Infusoria*, and *Entozoa*; until at last we are conducted to the confines of another scene, where the organisms of animal life are hardly to be distinguished from vegetable structures. This boundary passed, we ascend upon another scale to forms far different, but singularly beautiful, and quite as varied—the stately Oak, the Palm, the Mushroom, and the Lichen. Every blade of grass, every weed, exhibits a structure maintaining the functions of vegetable life, by which the materials of nourishment are drawn up from the ground, sent through millions of little pipes or tubes into the leaves, and in returning promote the growth of the individual, and secure the further propagation of the species by perfecting the seed.

To such an endless assemblage of living forms, you may well suppose that a great deal of learning, a great deal of observation, and an immense amount of mental labour has been devoted, for the purpose of their arrangement and classification; and as a system of classification is essential to the study of Natural History, I must detain you with a few remarks upon the matter. Naturalists, in the present day, are actively engaged in studying all the minute parts of animals and plants, both internal and external; so that their affinities and alliances in the great connected chain of Nature may be determined, and their true place in a *natural system* fixed. In this way the habits of animals and the sensible properties of plants are best associated, and their organization elucidated with the greatest accuracy. But this, which is the *natural method*, requires great industry and an extensive knowledge, and, I may say, is yet in its infancy. A vast deal has been done, but much remains to be accomplished; many links in the chain are wanting, and, unfortunately perhaps for *amateurs*, a host of hard names derived from the Greek are employed as terms of designation, and they have not given

an inviting aspect to the study. All this, perhaps, may be improved.

The Linnæan methods of classification are undoubtedly the easiest; but, based upon insufficient data, and looking chiefly to isolated facts, they have not that bearing or dependence upon those general views which are now taken of the kingdom of Nature. These methods have, therefore, been called artificial schemes; but this is not an appropriate term to bestow upon a system of classification which, however imperfect our increased knowledge of Nature may shew it to be, has done, and will yet do, a great deal in promoting a taste for Natural History, by presenting an easy and inviting introduction to a wide and difficult study. But Linnæus was the first to point out the desirableness of the natural method, indicating it as a pursuit worthy of a philosopher, though he thought it would be too difficult for the young scholar, because it depends upon such an extended series of mutual relations as can be understood only by a comprehensive view of the whole of the animal, vegetable, and mineral creation. The interpretation of Nature in her innumerable forms is, indeed, no easy task; and even now—as will always be the case in so vast a field—differences of opinion exist, controversies and discussions are going on upon many points; so that to the young naturalist there appears to be great difficulties in the study. All these, however, are more apparent than real. It must be remembered that as yet a part only of a great system has been discovered; therefore, discussions and differences of opinion are the means—the necessary means—for finding out that which is not, and for stamping a true value upon that which is, known.

I mention these things that you may not be discouraged by entering upon the study of Nature at a period of excitement and great change, while the workmen are all variously engaged upon detached points, and while, as yet, little seems securely settled. Remember that the proportions and beauty of a structure are hardly to be made out while surrounded by a mass of materials, and before those which are not wanted have been cleared away.

The great truths of progressive development throughout all organized beings, and the very gradual transition of the simple into the more complex forms, are now firmly established and agreed to on all sides: the difficulties lie in separating and characterizing particular groups, for the purposes of classification, from those which stand on either side in the extended chain of being.

A system of Natural History will include Zoology, Botany, and

Geology or Mineralogy.—Zoology embraces the whole animal kingdom; and, looking to the organization of every species, it is naturally divided into four great divisions. The first division *(Vertebrata)* includes all those animals which have a vertebral column or spine, supporting an internal bony skeleton. The second *(Mollusca)* have no internal bony structure; on the contrary, they are clothed externally with a shell or dense tunic, and are chiefly inhabitants of the ocean. The third division *(Articulata)*, so called because the different portions of their body are composed of moveable pieces articulated to each other, differ from Mollusca in generally possessing a skeleton, and from Vertebrata by the skeleton being external, and not internal. The fourth division (*Radiata*) differ from the three preceding in the greater simplicity of their structure, and in the almost total absence of any thing like a nervous system.

Botany embraces the whole of the vegetable kingdom; and referring to the organization of every species, it is naturally divided into two great divisions, *Vasculares* and *Cellulares*. Vasculares have a vascular and cellular structure, with delicate spiral vessels in their tissue; they have a sexual apparatus, and are propagated by seed. Cellulares have a cellular structure only, are destitute of spiral vessels, without any sexual apparatus, and the plants included are not propagated by seeds. If we proceed to investigate the structure of the great division Vasculares, it is found distinguished, by a truly natural character, into two sub-divisions; the one including plants which grow by the addition of new matter on the outside of the old *(Exogenæ)*, and the other those which grow by the addition of new matter in the centre of the old *(Endogenæ)*. Exogenous plants have a structure composed of a central pith, an external cellular or fibrous ring or bark, and an intermediate woody mass, well-illustrated in a young shoot of Elder. Endogenous plants, on the other hand, have neither bark, nor pith, nor wood, but are made up of tubes and fibres imbedded in cellular substance, as in the Palm, the Cane, and Bamboo. Again, in *Exogenæ* the seed is *dicotyledonous*, and the veins of the leaf are variously netted; in *Endogenæ* it is *monocotyledonous*, and the veins of the leaf are parallel. It is thus we look to structure and physiology for the first lines of a natural method of classification, both in animals and plants; and you will find all the standard works upon Natural History which have been lately published adopting these views.

I now refer you to the following classification of the several tribes of animals; and, commencing with the simplest forms, shall

endeavour to illustrate my remarks by reference to various specimens from the museum.

Radiata.—Polygastrica, Poriphera, Polypiphera, Acalepha, Echinoderma.

Articulata.—Entozoa, Rotifera, Cirrhopoda, Annelida, Myriapoda, Insecta, Arachnida, Crustacea.

Mollusca.—Tunicata, Conchifera, Gasteropoda, Pteropoda, Cephalopoda.

Vertebrata.—Pisces, Amphibia, Reptilia, Aves, Mammalia.

If we place a drop of any decayed infusion of animal or vegetable matter under a powerful microscope, and pass a ray of light through it, we discover in that drop various forms of living beings: some of a rounded, some of a lengthened form; others exhibiting various ramifications; but all apparently of a soft transparent texture. These singular animals abound in the stagnant waters of rivers and lakes, and are found in every drop of the ocean. They are called Polygastrica, because, under a very high magnifying power, they are observed to have several internal cavities or stomachs. Although crowded together by thousands, their motions seem to be regular and methodical; and they are seen to advance, recede, and stop at pleasure.

Inhabiting the shores of the sea, covering the rocks, and sometimes hanging in branches from the cliffs, are the sponges and various sponge-like bodies. They are termed *Poriphera*, from the innumerable pores, canals, and tubes, of which the firmer textures of the body consist, and through which the salt-water is found constantly circulating. When these sponges are torn from the rocks the softer parts of the animal run down like oil. If at this time we cut the sponge in pieces, the salt water may be seen, under the microscope, rushing through the pores and canals of each separate piece, although we can observe nothing in the structure to explain the motion. The strongest stimuli fail in exciting the slightest movement; strong acid or a hot wire does not cause the slightest trembling: yet the usual currents still go on.

The *Polypiphera* inhabit the sea in every clime. These beautiful varieties of coral and corallines now before me are the skeletons of polypipherous animals, which ramify and branch out in masses from the bottom of the sea. Sometimes covering these elegant masses are thousands of little carnivorous animals; sometimes in the interior there is a soft fleshy substance, which is the body of the animal. These *polypiphera* are an exceedingly interesting group, well worthy your attention.

The *Acalepha* are, for the most part, gelatinous animals, inhabiting all parts of the ocean. They are generally transparent, and of a very simple structure; for instance, the *Medusa* and *Physalia*. They all excite a tingling or stinging sensation when they touch the skin of man: hence the name of the family. Among the *Acalepha* are many animals of great size, swimming freely through the sea by their own exertions, possessing a complex digestive apparatus, and having, for the most part, numerous long and exquisitely sensitive tentacula. There are others, as the *Actiniæ*, which are fixed.

The *Echinoderma* are also marine animals. The *Asterias* (Star-fish), *Echinus* (Sea-egg), and *Cidaris* are types of this curious family, specimens of which are before you, many of them with their natural spiny covering. The large fossil tribe *Crinoidea* (Encrinites, Pentacrinites, and others), which you may study hereafter in the museum, is composed of fixed individuals belonging to this family.

With regard to the anatomical structure of these simple Radiate animals, we find a homogeneous more or less transparent body; sometimes, as in Polygastrica, divided into distinct little sacs or stomachs; sometimes (in Poriphera) supported upon a flexible elastic sponge; at others (Polypiphera) upon a hard calcareous skeleton: but we find nothing like nerves—the peculiar characteristics of a higher order of development—in any of these animals. Nerves first begin to appear in *Acalepha*: and in the *Echinoderma* we observe a distinct nervous filament, and the first appearance of muscular fibre.

Frequently found in the interior of the best-protected organs of the higher animals—in the liver, the muscles, the alimentary canal, and even in the substance of the brain—are various species of parasitic worms, belonging to the class Entozoa. Upwards of fifteen distinct kinds are known to infest the human body, where many of them give rise to well-marked symptoms of disorder—for instance, the *Ascarides*, Tape and Guinea Worms. A very minute Entozoa, enveloped in a cyst, has been lately discovered in the dissecting-room of St. Bartholomew's Hospital, existing in astonishing numbers, imbedded among the fibres of the voluntary muscles of the human body. They appear to breed and exist in the living flesh, without giving rise to any symptoms yet known. Classed with these Entozoa is a singular, long, hair-like animal, inhabiting ditches, called the *Gordius aquaticus*, from the complicated knots they are capable of forming with their long slender body. I notice it particularly because many persons, not versed in Natural History, think it is merely a horse-hair animated by being steeped in water; and some

will tell you that they have seen the hair grow into a living worm. It is a curious fact that many fish are infested with various forms of Entozoa, which attach themselves upon the lips, eyes, and other tender organs, by means of a little hook developed near the mouth.

The *Rotifera* are minute microscopic animals found with the *Polygastrica*, but removed from them in the classification we have adopted, because their organization is more perfect and complex. The *Cirrhopoda* are inclosed in shells of carbonate of lime; all timbers exposed in the sea, and the broken utensils and instruments thrown out from vessels at anchor, are soon covered with them. Many Cirrhopoda are found adhering to the backs of Whales and Porpoises. The Common Barnacle and several species of Lepas now before me, will serve to illustrate this curious family.

Inhabiting the soils of all continents, and burrowing by millions into the sands of the sea shore, are various species of worms, constituting the class *Annelidæ*. The beauty of the forms, the structure, and the colours of many of these worms are not exceeded by those of any other animals; and their astonishing numbers render them important in the economy of Nature: they display as much the hand of the Great Artificer and are as perfect for their objects as man himself. The time is now past for ignorance to sneer at the anatomy of a worm: to overlook any of the links in the great chain, or to attach insignificance to any particular stage in the general process of vital development, would betray a gross indifference to the more interesting and philosophical parts of Natural History.

If you examine the Common Earth-worm, which may be taken as the type of the *Annelidæ*, you may see that it is surrounded by rings extending from one extremity of the body to the other, and you may detect by a close examination *eight* very short, pointed, tubular *feet* attached to each ring or segment: by the naked eye they can hardly be perceived, but you may feel them with the finger and see them by the aid of a lens. In the next class, *Myriopoda*, the legs are much more developed and the segments of the body more conspicuous; for example, in the Centipede. *Insecta* is a very large and interesting class, including all those animals which undergo metamorphosis from a caterpillar to the chrysalis, and from that again to the perfect form: Moths and Butterflies, Wasps and Bees, are sufficiently familiar examples. Allied to insects are the *Arachnidæ*—Spiders, Scorpions, &c. These are distinguished from insects by being destitute of antennæ, they have no wings, and are not subject to any metamorphosis.

Fossil *Myriapoda*, *Insecta*, and *Arachnida* occur in great numbers

in bituminized vegetable resins or amber, in the tertiary calcareous slates, and in gypsum; many fossil insects are found in the brown coal and bituminous marl slate. The accordance of these extinct forms with those now existing, and the narrow limits of their variations, shew in an extraordinary manner the unity of plan which pervades every department of the animal kingdom. We find just the same system and harmony in the laws which regulated the formation of these beings thousands of ages ago as are now manifested.

The *Crustacea* may be called the spiders of the sea: the Lobster, Crab, and Shrimp are sufficiently known to you. Many of the species in this class are very agile and sprightly: and although the mode of progression in the Lobster and the Shrimp is tail foremost, still they are capable of taking an extensive spring, the former bounding to a distance of thirty feet by one or two sweeps of the tail. Perhaps the most interesting fact I can mention respecting these crustaceous animals is that of their periodically casting off their shelly covering. The old shell is removed in detached pieces, the animal escaping from it with a soft newly-formed epidermis, which soon secretes the earthy matters to form a new shell, thin layers being deposited in succession until the animal has formed for itself an entire jointed sheath, corresponding with the increased magnitude which it assumes at each fresh casting of the shell. Many interesting forms of fossil *Crustacea* are found in the London clay. The crustaceous animals complete the second grand division of the animal kingdom.

The simplest family of the molluscous animals is the *Tunicata*; so called from their soft transparent external covering. These animals are closely allied in their structure to those inhabiting *bivalve shells*. They are often found thrown upon the shore by the agitated states of the sea. The *Tunicata* frequently cover themselves with an adventitious solid earthy matter formed of particles of gravel, shells, or mud. The beautiful little *Pyrosoma*, myriads of which contribute to illumine the ocean at night, especially in tropical regions, is one of the class *Tunicata*.

The *Conchifera* include all the inhabitants of bivalve shells. In the study of Zoology, as now pursued, these shells and their architects must be considered together; and Conchology, as formerly understood, can hardly be considered as forming any part of Natural History, unless we allow that it embraces what the French call *Malacology*—that is a history of the animals which the shells inclose. The Linnæan Conchology may be very useful to persons collecting shells as beautiful objects of creation; but when we wish to study

Nature, we cannot overlook the animal which is their sole architect. The shells of the more abundant species of Conchifera sometimes form the entire line of beach along the sea shore for miles, and in many places they are burnt for lime. The *Teredo navalis* bores by means of its shells into the hardest timber, and the genus *Pholas* buries itself in the hard rock. Many shells of Conchifera are here before you, and they display great beauty in their forms and colour. The recent, waved, and inner layers of the shell are generally more pellucid, have greater lustre, and are more transparent than the exterior layers, which have been longer acted on by the water and by the sand and gravel which wash over them. Upon removing the outer layers, we often obtain the remaining inner portions of a beautiful pearly lustre, constituting in fact mother-of-pearl.

Pearls are formed by conchiferous animals. A little particle of sand, perhaps, gains access between the mantle of the animal and the last formed layer of the shell, the irritation it creates causes the nacrious matter to be thrown out, and successive layers being deposited a pearl is formed. The Chinese have a practice of forcing the Swan Muscle to make pearls by throwing into its shell, when open, three or four very small mother-of-pearl beads: in the course of a year or two they are found covered with a crust perfectly resembling pearls.

Animals inhabiting univalve shells are termed *Gasteropoda*, because, like the Common Snail, for example, they creep upon a muscular disc which extends along the lower surface of the body. Gasteropodous shells are, many of them, very splendid and exceedingly varied in form and size. Immediately beneath the shell is the mantle of the animal by which it is secreted, and when the shell is broken the mantle has the power of repairing it.

Closely allied, in many respects, to the three last tribes are the *Pteropoda*, small delicate animals, swimming together near the calm surface of tropical seas by means of curious wing-shaped membranes, from which they derive their scientific appellation.

The *Cephalopoda* approach nearest to fishes. The name is derived from the circumstance of the feet of the animal closely surrounding the head. Several of the *Cephalopoda* inhabit a pecular kind of shell, composed of a series of chambers, and constituting a multilocular or polythalamous shell; for instance, the Argonaut and the Nautilus. The *Sepia officinalis* is a very remarkable cephalopod animal. The family is an extensive one, and will prove highly interesting to those who have opportunities of studying it. Among

the fossil shells which formerly belonged to animals of this description, the Ammonite is the most remarkable. Here are several fine specimens of fossil Ammonites: all the connecting calcareous matter has been removed from the septa, and the different chambers have been filled by an infiltrated stony material, with serrated and dovetailed margins. Upon looking at them in this loose detached condition, they look very like vertebræ, and they have by some been taken for the vertebral columns of Serpents. The animals to whom these shells belonged are entirely extinct. Although four hundred distinct fossil species are described by naturalists, and more than one hundred of these are met with in our own strata—although they sometimes occur in such abundance that whole rocks are composed of little else—yet *not one living individual* is now known to exist on the face of the earth. Large specimens of Ammonites are sometimes built into the front of houses, particularly in Somersetshire and Yorkshire, and they are looked upon by the peasantry as petrified Snakes. You are not to conceive that in these enormous remains of the Ammonite you are looking upon the testaceous covering of the animal: this has been entirely removed, and you observe a cast of the interior of the shell only.

We are now arrived at the inportant division, *Vertebrata.* The first class is the *Fishes;* the next the *Amphibia,* comprehending Frogs, Toads, &c. This is a deeply interesting family, embracing beings changing, in all their internal machinery, from their aquatic condition, to beings which live and breathe in the atmosphere—undergoing a metamorphosis which affects their osseous, vascular, nervous, and even their digestive systems—changing, in fact, their whole structure.

Reptilia comprehends the different kinds of Serpents, Crocodiles, Lizards, and Tortoises. These are the last of the cold-blooded animals; they do not undergo any metamorphosis—a character so prominent in the preceding class. Many of the secondary rocks, especially the Lias Limestones, abound with remains of extraordinary and gigantic reptiles, which appear to have abounded in the former seas and estuaries of the globe.

The next class, *Aves,* is the first of the hot-blooded animals. Here is a beautiful and interesting department of Natural History: we all derive pleasure from reading an account of any observations on the habits, migrations, and plumage of birds; and you will be gratified to learn that Ornithology is likely soon to boast of an association of naturalists who will pay particular attention to every thing relating to it. The London Ornithological Society propose

forming extensive gardens, in one of the public parks, for the display of foreign and indigenous birds of all kinds.

The class *Mammalia* is too well known to require from me any examples. I will now ask you to pause for a moment, to connect the various objects presented to your notice, and the whole animal kingdom is before you, forming a grand and harmonious picture. Extend your mental vision to the Heavens, and what another glorious scene! The imagination here may wander through endless realms of space, occupied by masses of matter, in magnitude and rapidity of motion surpassing the powers of our finite comprehension. If you ask their size, or try to measure them by magnitudes within your reach, the attempt is hopeless. All the animated beings on the earth, its forests, and its mountains, bear no greater relation to its size, than the bloom upon a plum. And then, again, the globe itself, with all it bears upon it, is lost in the greater immensity of the heavenly bodies. If you ask of what materials these bodies are composed, with what forms of living beings they are peopled, reason, philosophy, and science, return no answer. Your imagination may picture from analogy the purposes for which they were created, and may people them with myriads of living forms; but how poor, how insignificant, is your attempt to scan or comprehend the works and designs of Infinite Power, exerted with endless duration in infinite space!

LOOSE THOUGHTS ON THE CAUSE OF BEAUTY, &c., IN ARCHITECTURE.

In this enlightened age there is something eminently ridiculous in a person (fancying himself in advance of his fellows in intellect and knowledge) publishing his lucubrations with all the solemnity of an oracle, and appearing ready to burst with the magnitude of his discoveries, when, in fact, all his sublime thoughts are shared by thousands.

When we reflect on the great number of public buildings which have pretensions to beauty and design, but which are so various in form, and so diametrically opposite in the principles of their composition—even in those intended for similar purposes, which ought certainly to have some similar expressions—we must perceive the

want of some analytical principles to guide the architect in designing public buildings, and the public in judging of them. That a great many men have the same views with myself, and infinitely surpass me in their researches, is very true; but it is equally as true that the greater number have what appears to me a very erroneous idea of the subject.

Artists, by the very nature of their occupation, are accustomed to think more of the causes or things which produce the emotions of taste than of the nature of the emotions themselves. From this habit they are apt to imagine that there is, in the constitution of man, some *one* sense, with its organ, by which beauty is perceived and felt; this brings along with it the idea that certain forms of matter are intrinsically and inherently beautiful in themselves. On the contrary, men of retired habits and philosophic minds resist the idea of any such particular sense; they suppose the foundation of the emotion of taste to reside in some general law of our constitution. Such were the theories, a thousand years ago, of St. Austin, who attributes these emotions to our perceptions of order or design; and of Mr. Hume, who attributes them to our sense of utility. These were the kinds of theories which prevailed until Mr. Alison, in the year 1790, published his *Essays on Taste*, in which quite a new theory is submitted.

The foundation on which the former systems were raised was the supposition that the emotion of beauty was a simple emotion: Mr. Alison supposes it to be a complex one. And after a very minute and careful examination, most plentifully illustrated, he comes to the conclusion that, "whenever the emotions of beauty or sublimity are felt, that exercise of imagination is produced which consists in the prosecution of a train of thoughts;" and that the difference between such trains and our ordinary trains of thought "consists, 1st. In the ideas which compose them being, in all cases, ideas of emotion; and 2nd. To their possessing an uniform principle of connexion through the whole of the train." So that the pleasure arising from the emotions of taste results from the conjunction of the pleasure of simple emotion with that which, by the constitution of our nature, we feel when our imagination is exercised; with this proviso, that such exercise is employed in the prosecution of a "*regular* train of ideas of emotion."

Although I think Mr. Alison has, in his *Essays*, proved his theory to be correct, he has failed in applying it to the examples he illustrates in several instances. His division of the kinds of lines which bound objects, and in which their *expression* is supposed to

exist, is certainly incorrect. He divides them into even, uneven, angular, and waving or winding; and each of these kinds he subdivides into fine and strong. Fine and strong have nothing at all to do with the question, although he makes it a great consideration; for the outline of an object is, to all intents and purposes, a mathematical line, "length without breadth." He supposes fine and waving lines the most beautiful, because they are expressive of delicacy and ease. It is just possible the cause arises from the mechanical action of the muscles of the eye.*

As beauty lies not in any inherent quality of the object itself, but in the power of its combined expressions to excite the imagination to the prosecution of a regular train of ideas, the first thing to be considered, in investigating the causes of the beauty of a building, must be the nature of these expressions.

The *expressions* of which a work of Architecture is susceptible, may be divided into—*First, The physical or natural expression of the material.* Although no great source of beauty in itself, this expression is certainly a concomitant, and one which cannot be overlooked: for instance, a building of stone has a much greater expression of strength and durability than one of cement; and one of cement has a more cheerful and finished expression than one of brick. With the progress of science and philosophy the mode of construction and our ideas of durability will be gradually changed in proportion to our advance in the knowledge of the nature of materials; therefore this expression is not a lasting one. Thus, in

* "*Reasons why Arcs of Ellipses or Circles are pleasing to the Eye.*—Professor Müller, of Berlin, has, in a late course of lectures, offered a simple and mechanical explanation of the universal admiration bestowed on these curves. 'The eye,' he observes, 'is moved in its socket by six muscles, of which four are respectively employed to raise, depress, and turn to the right and to the left, the other two having an action contrary to one another, and roll the eye on its axis, or from the outside downwards and the inside upwards. On an object being presented to the eye for inspection, the first act is circumvision, or going round the boundary lines so as to bring consecutively every individual portion of the circumference upon the most delicate and sensitive portion of the retina. Now, if figures bounded by straight lines be presented for inspection, it is obvious that but two of three muscles are required; and it is equally evident that in curves of a circle or ellipse all must alternately be brought into action. The effect, then, is that, if only two be employed, as in rectilinear figures, these two have an undue share of labour. And by repeating the experiment frequently, as we do in childhood, the notion of tedium is instilled, and we form gradually a distaste for straight lines, and are led to prefer those curves which supply a more general and equable share of work to the muscles.' "—*Mechanic's Magazine*, Feb. 4, 837.

the present day, we know that a building of hard bricks covered with cement is stronger and more durable than one of our modern stone buildings, because the bricks, forming one homogeneous mass, will sink or settle equally, but, in the stone erection, more mortar being used on the inside than on the outside of the walls, the inside will sink the most. When this fact becomes generally known and acted upon, a cement building will be more expressive of strength than a stone one.

Secondly, The expression of fitness as regards construction. Of this we will speak presently.

Thirdly, The expression of design. Of this there are two kinds: the first, and least lasting, may be simply but correctly defined as *novelty of form.* The second kind is a sort of improvement on Nature, and is the setting a marked difference between the work of genius and art and a mere imitation. A good imitation of Nature is always *curious,* but, to sensitive persons, frequently painful. No one thinks of comparing the beauty of a statue of stone or marble with that of a wax figure. In statues especially the artist has the power of preserving the unity of expression in every limb, feature, and muscle, which in Nature is seldom the case. Flowers and foliage should always have an artificial arrangement, and should look (as Mr. Loudon expresses it) "sculpturesque" to partake of this expression.

Fourthly, The expression of fitness in the parts to attain the end in view, or to produce the expression of character.

Fifthly, The expression of character, without which there can be no permanent beauty. It is an expression very difficult to explain, and one that applies to an edifice considered as a whole. The buildings of the ancients and the middle ages have this expression in a very great degree; but I imagine much of it arises from the fact of each age having had its own peculiar style of Architecture; so that in addition to the character they originally expressed, all our associations connected with the characters of their respective ages are vividly recalled. This expression and the preceding one are intimately connected. Beauty exists in proportion to the *unity* of the expression of character in all the parts.

Sixthly, The accidental expression, which may last for years or but for an hour—may be caused even by the particular state of the atmosphere or our particular state of mind at the time a place is viewed. This expression is the cause of much difference of opinion: some particular feature of a building may accidentally recall peculiar associations of pleasure or pain, and cause a person to like

or dislike the structure; whilst another in company, having different associations, would quite differ in opinion. It is impossible for the utmost art to invest a building with this expression, and quite as impossible to guard against its ill effects.

It is too commonly the case that Architecture is considered merely as an art of detail or of parts. If it is viewed in its proper light—that is as the *poetry of building*—the *end* of the art will at once be perceived. Style or order has nothing to do with it, further than as a means of preserving a unity of expression which is indispensable; but styles or orders do not preserve this unity of themselves. The *reason* and *imagination* of the artist has as much labour to perform *now* as if there existed none. I have observed builings in which some example of the ancients has been executed with very great exactness, perfectly devoid of character.

Perhaps the term most used with regard to architectural compositions is proportion. It is often used in a wrong sense, as if there were some particular proportions abstractedly beautiful. Proportions I conceive to be of two kinds: first, where each particular part seems to do its service towards supporting the fabric, and to be essential to that end: such is the meaning of the second expression, viz., fitness, with regard to construction. The second proportion is when the spaces or masses are so equally and justly balanced that no part or member intrudes itself on the view, but all the members are seen without tiring the sight. In such a case the eye takes in the large spaces first, and then the smaller, until all are perceived, without the mind or the eye being cloyed or fatigued.

The principal examples of Grecian Doric seem to have attained the perfection of both kinds of proportion; and as these qualifications are productive of a very quiescent pleasure without much exciting the imagination, they render this order very appropriate for churches and chapels. Keeping the primary expressions always in view, proportion may be called the distinctive marks of beauty. A building, to be beautiful, should not be of a vast size, rather sparing of ornament, which should be quite devoid of intricacy, with the contrasts not too marked or glaring. In fact the chief causes of beauty are proportion with just as much variety as will prevent tameness and monotony without injuring the unity of expression or the regularity. I will just observe that it has been customary to ascribe beauty to uniformity and variety, which *is*, what it appears to be, a contradiction. Regularity and variety is the more correct term.

When we see three or four men employed in hoisting up and set-

ting one moderate-sized or comparatively small stone, the *means* appear so very inadequate to the end of raising a large building that we seldom or ever think of *how* many large buildings (such, for instance, as our old cathedrals) were erected. We look at them with a sort of religious feeling, as if they were indigenous to the soil. Any thing large or massive is so connected with our ideas of superior power that it is impossible to throw together a large quantity of materials without a certain stateliness or grandeur of appearance. So it is that many large buildings which, from their size, look grand, are very popular, and are said to be sublime, although in reality they are but indifferent designs. Witness St. Peter's at Rome, of which Prince Puckler Muskau says, "The vast multitude of pillars, vaultings, chapels, niches, altars, and monuments—all, for the most part, overloaded with innumerable badly designed and badly executed ornaments, consisting of arabesques, zig-zag flourishings, symbols, and coats of arms, or of bas-reliefs, doves, angels, and popes, together with saints and patriarchs of all dimensions—all this constitutes such a cut up and confused *ensemble* that it is impossible it should impress the beholder with that feeling of unity and grandeur as does the first view of the Pantheon in a manner perfectly irresistible!" The lavish profusion of ornament and the modern appearance the church derives from it, combined with its prodigious size, frequently lead those who are astonished by it to exclaim in a tone of enthusiasm that it is as sublime as it is elegant! Yet if we ask ourselves what is meant by elegant sublimity or sublime elegance, we are tempted to regard such a compliment as nothing else than a sarcastic epigram." Large buildings, although they may be grand from their size, can only be made sublime by the genius of the artist.

Perhaps a degree of uniformity is as necessary in large buildings as (after the original expressions) any other quality. By extraordinary richness and intricacy of detail, a bewildering magnificence may be raised: yet it will not satisfy the man of taste, and will soon fatigue even the vulgar. But uniformity excites the imagination by producing almost the idea of *infinity;* it does not tire the sight, it assists the mind in comprehending the whole, and displays the various beauties and remarkable phenomena of perspective to the greatest advantage.

It is a common thing with architects to pronounce a building good or bad merely from the correctness or incorrectness of mouldings, ornaments, &c., without considering the more noble and important ends of design. It is this practice, together with certain

other mystifying expedients, which has made the name of *architect* almost synonymous with *charlatan*.

In a well-designed building the original expressions, or rather the expression of character, will be the most apparent. And on a first view no part ought to be so conspicuous as to attract the notice of the observer before he has had time to comprehend the whole; after which the proportions ought to be such that he can transfer his attention from the greater to the less in a regular gradation, without any difficulty.

With regard to the different kinds or styles of Architecture, I imagine the genius or rationale of them is not sufficiently studied. The Grecian is too severe to be used with much propriety in the present age; in fact, a very great degree of its beauty lies in the effect of light and shade, to which our smoky towns and humid climate are not very advantageous. Besides, the simplicity of form which is so essential a character of it is not suited to our convenience. The ancient Roman or modern Italian are much more suitable to us; they are susceptible of any shape and degree of richness, and have several bold features which other styles have not. But Gothic Architecture is the wide field for improvement; its capabilities of form or character have no bounds. The chief fault of modern Gothic lies in its meagreness; and in costly buildings, the not preserving a regular gradation of enrichment, from the bold projecting base to the pierced battlement and crocketed pinnacles. In plain or cheap buildings massiveness ought to be the character, and they ought to look as if considerations of strength and durability, and not poverty, had caused ornament to be overlooked. It is especially adapted to very large buildings, such, for instance, as the Houses of Parliament. In such a case it would, perhaps, be better not to have too much regularity, but to have the appearance of a pile of *buildings*, rather than *one* large *building*.

Nothing would tend more towards the advancement of Architecture than for architects to bear in mind the following opinion of Mr. Addison:—"Music, Architecture, and Painting, as well as Poetry and Oratory, are to deduce their laws and rules from the general sense and taste of mankind, and not from the principles of those arts themselves; in other words, that the taste is not to conform to the art, but the art to the taste."

THE BIRMINGHAM MUSICAL FESTIVAL.

PREVIOUS to entering on the consideration of the last Birmingham Festival, it is the intention of the writers of the following remarks to lay before the readers of *The Analyst* certain general reflections concerning the legitimate purpose and scope of such meetings. To this course we have been irresistibly impelled by the conviction that principles of no mean importance to the welfare of mankind are involved in the question, Whether musical festivals are deserving of encouragement from the reflecting and the conscientious? or whether they are an evil against which it is the duty of the pious and the virtuous to make a vigorous stand? The task which we have undertaken is rendered the more necessary from the circumstance that while the opponents of musical festivals have boldly and in tangible terms urged serious accusations, their assertions have hitherto rather been evaded than fairly met, rather set aside than satisfactorily refuted. Whilst we admit that, in the present state of the controversy, the objectors have the best of the argument, it nevertheless appears to us that the notions of both parties are erroneous, or at best shallow and one-sided. When, on the one hand, we hear these meetings extolled for the assistance which they render to charitable institutions, and on the other inveighed against, in no measured terms, as fostering impiety, as introducing the profane thing into the "holy of holies," and as gratifying the flesh at the expense of the immortal spirit, we conceive that both praise and blame are attributed where they are least of all due, from the confused notions of right and wrong possessed by both parties, and from the substitution of those notions for the broad and immutable principles which reason, properly employed, is capable of deducing from the word and works of the Creator. Thus will men ever pursue an erratic and devious course, so long as they allow themselves to be tossed by conflicting opinions, without the compass of reason to warn them off the shoals and sand-banks on which their feelings, passions, and prejudices, are but too apt to strand them. How long will they keep their eyes rivetted on the surface, neglecting the things which lie hid from immediate view, ignorant that precisely these are the most worthy of examination? How long will they prize the letter above the spirit, the expression above the thought which it clothes? When will their eyes be opened to the fact that the errors, the vice, and the misery, caused by ignorance, exceed a hundred fold the sufferings produced by *wilful* mis

deeds? Let the grand principle be once acknowledged, that every disputed point can only be properly decided when the reasoning faculties, holding the observing powers and the feelings in due subordination, use them as their servants; that outbreaks of feeling, however genuine, will, if allowed the supremacy, only, like the lightning's flash, render more palpable the darkness which conceals from us the face of truth. Let this be once acknowledged, and we may rest assured that the sun will presently rise to guide us in our search, and reveal to our view features glorious in their grandeur and their simplicity, to behold which is our best reward after our greatest difficulties, our greatest trials.

It is stated that the main end of a musical festival is charity; its object to relieve the distresses, and alleviate the unavoidable misery of our indigent fellow-creatures. Supposing the end to be good, does this sanctify the means? Decidedly not: yet this is the principal plea on which the supporters of these performances have rested their defence. Let us examine somewhat minutely into the nature of the good work to forward which we are invited to join heart and hand. Let us recollect that although we may intend to do good, yet if the means we employ are productive of evil, intentions will not exculpate us. If to will the good of others be a duty incumbent upon all men, it is clearly no less obligatory to discover and put in practice the best means for accomplishing the desired end. If, through mental indolence or self-esteem, we refuse to apply our reason to so noble a purpose, the evil which we occasion will lie as clearly at our doors as if we refused to stretch out an arm to save a drowning fellow-creature.

It may, perhaps, tend to set the present question in a more striking light if we put a hypothetical case. Suppose a *nation* were to institute a festival for the purpose of attracting foreigners to subscribe funds for the maintenance of the poor, the aged, and the sick: in what terms would an enlightened stranger describe so extraordinary a custom? He would conclude, and justly, that there must be something fundamentally wrong in the policy and institutions of that state, and that such make-shifts must lead to a ten-fold aggravation of the evil. The absurdity of one nation appealing to another is, indeed, palpable to the meanest understanding. Supposing England to contribute £10,000. towards the maintenance of the French poor, France would, for the moment, have the means of procuring in greater abundance the necessaries of life; and this circumstance might, to a short-sighted French patriot, appear cause for congratulation. The Frenchman would, in some measure, be excusable if,

while exulting over the temporary accession of wealth to his own country, he was indifferent to the corresponding impoverishment of his insular benefactor. But no one can pretend that in any given country (England, for example) the slightest good is effected by depriving one set of men of their daily bread, in order to support another in idleness. As the distress in this country is caused by the supply being insufficient for the population, it is evident that no alteration in the *distribution* either of bread or of the means of procuring it can have the slightest effect in removing the evil, and that the only remedy lies in increasing the aggregate capital by so expending it as to produce an adequate return; the effect of which would be to raise the value of labour in proportion to that of the necessaries of life, thus putting it in the power of every industrious man not merely to enjoy comforts to which he is at present a stranger, but to lay by a fund for the season of scarcity or sickness. It lies not within our province to indicate the means by which every human being may be placed above the humiliating necessity of depending for subsistence on the exertions of his fellow creatures; suffice it that we record our conviction that to apply the intellectual powers to the discovery and comprehension of the laws which regulate the inmost recesses of the social fabric, and by fearlessly applying them when discovered; to use our utmost exertions in forwarding that glorious consummation, "the greatest happiness of the greatest number," is the only true charity, the best fulfilment of the Christian precept, "Do unto all men as ye would that men should do unto you."

We next proceed to examine whether the festivals themselves are amenable to the serious charge of being an idle and sensual pleasure affording no profit to the soul, but rather tending to foster impiety and irreverence for the Deity; or whether, on the contrary, they do not rather afford delight and cultivation to some of the highest faculties of the human mind. It is on this ground that, in the estimation of all thinking men, they must stand or fall. If we can prove that performances of sacred music on a grand scale are a legitimate source of pure, extended, and ennobling pleasure, the conclusion will be inevitable that they cannot be too widely diffused nor rendered too easy of access, and that to the furtherance of this object ought the receipts to be exclusively dedicated.

The readers of *The Analyst* are, in all probability, generally acquainted with the language of Phrenology; we shall, therefore, in future, make no scruple of employing it in illustration of our ideas

on Music. That it is a duty to cultivate every faculty, that each is in its own nature good, only becoming hurtful when allowed unduly to preponderate, that the exercise of each is a source of pleasure, are axioms of phrenologists which few, we hope, will controvert. Although, however, all the faculties are good, and, if used aright, productive of happiness, they nevertheless differ widely in the rank which they hold in the mental scale. By the wise and benevolent arrangement of the Creator, the exercise of the higher faculties affords a greater degree of pleasure than that of the lower. Hence the pursuit, art, or science which employs the greatest number of the highest faculties is calculated to impart the greatest portion of happiness. Let us apply this test to Music. The two primitive faculties essential to the cultivation of this art are *Time* and *Tune*, the latter giving the perception of the relations of sound with regard to pitch, the former with regard to duration and rhythm. These we maintain to be common to the whole human race, and the assertion is strongly corroborated by the existence of a taste for music of some kind among the most savage, as well as among the most civilized, nations. Now, as God has endowed all men with the faculties which render music pleasing, and as he has, moreover, presented them with the most perfect mechanical means of gratifying those faculties—namely, the human voice—it seems self-evident that this beautiful adaptation between the desire and the power of satisfying it was intended to lead to a certain result, and that result was the art of Music. It seems equally evident, that he who cultivates these faculties fulfils a part of the intentions of his Creator, while he who neglects them is like the slothful servant who buried his talent under ground.

It may, perhaps, be objected by those who have no faith in Phrenology, that music is an artificial and factitious taste—a morbid and unnatural excitement—an art of man's devising only. For the benefit of such cavillers, laying aside for awhile phrenological language, let us state a few elementary facts, which satisfactorily prove that however music may have been improved by the art of man, it has its origin in Nature; and which, by shewing that Music, equally with Painting, Sculpture, and Poetry, is derived from the immutable laws of Nature, and the constitution of the human mind, place it on the same basis as one of the fine arts. Sound is the effect of the vibrations of matter upon the atmosphere. When these vibrations succeed each other at regular intervals a *tone* or musical sound is the result; when at irregular intervals, a noise.

Every tone gives rise to an indefinite number of others, produced by the aliquot* parts of the sonorous body. The principal sound is termed the *fundamental note*, those caused by it, being much softer, *harmonies*. Since, then, a fundamental note with its harmonies form a common chord, there is, properly speaking, no such thing in Nature as a simple sound. Now with every sane human being the power of distinguishing, and deriving pleasure from, sounds thus produced, is equally innate with that of calculating numbers and discriminating differences of form. On this ground we are no way afraid of contradiction from those whom experience has qualified to decide.

The art of Music, then, having Nature and the constitution of the human mind for its foundation, has been gradually brought to its present state of complication by following out the principles which regulate sounds, and by taking advantage of the properties possessed by their combinations to excite the imagination and the feelings. The arithmetician investigates the properties of numbers, the geometer those of lines, and the chemist explores the qualities of matter; and although each effects combinations not to be met with in Nature, their pursuits have never been stigmatised as unnatural. To bring the analogy yet closer to our subject—the painter, in combining forms and colours, light and shade, employs materials furnished by Nature, yet scruples not to apply them in a manner far from identical with hers: they are but the instruments, with which, working out the imaginings of his own mind, he produces a work of art. Even so it is with the composer. He is the poet, not of words, forms, or colours, but of sound. If *his* art is to be condemned as unnatural, on the same principle ought every other art and every science which effects new combinations to be blotted out from the book of human attainments. Leaving the defence of other branches of knowledge in the hands of those who are both able and willing to ward off the feeble attacks of the lovers of darkness, be it our task to explain the grounds on which Music rests its claim to rank as one of the noblest arts vouchsafed to man for his happiness.

The oscillations of a sonorous body cause vibrations in the atmosphere, which, in their turn, acting upon the external and internal mechanism of the ear, affect that portion of the brain whose function it is to judge of their pitch: each set of vibrations gives rise simultaneously to innumerable others, which, by the spontaneous action of Nature herself, afford the mind exquisite delight. When

* Parts related to each other in the ratio of 1, 2, 3, 4, &c.

we contemplate this chain of contrivances, so perfect in all its parts —when we consider that, by further study and more intimate acquaintance with the properties of sound, we have been enabled to vary and extend the simple accords of Nature,

> "Untwisting all the chains that tie
> The hidden soul of harmony"—

when we behold this admirable mechanism and its splendid results —what shall we say to the vain, short-sighted man who would fain persuade us, not only that so much skill has been lavished in vain, but that to employ the means which the Creator has placed within our reach is actually sinful?

The two faculties already enumerated may be said to constitute the foundation on which the splendid fabric of the musical art rests. We now proceed to the consideration of those loftier mental powers which contribute to the beauty and grandeur of its superstructure.

Ideality is the soul of art. Without its ethereal spirit Poetry degenerates into mere rhyme, Painting and Sculpture into a slavish imitation of Nature, and Music into a mechanical series of sounds incapable of affording the soul higher pleasure than the cowherd's horn or *Ranz des Vaches* to the flocks which browse on Alpine pastures. Ideality raises up before the mind's eye visions of beauty surpassing far the cold representations of corporeal sense; it wafts to the ravished soul harmonies inconceivably more pure and more lovely than mortal ear has ever heard. It is the fairy-land of the soul; enchanted ground, where realities have no place, and grovelling ideas find no entrance; where the enfranchised spirit revels amid forms exquisitely beautiful, and mazes of sound which never weary, never cloy. Such feelings are the noblest proof that man is destined for a higher sphere of action than that in which he here moves; for it is inconsistent with the wisdom and benevolence of the Creator to suppose that he would have implanted in him aspirations so ardent after excellence unattainable here below, had he not been created with reference to a state in which those aspirations will be fully satisfied. And thus we are enabled to comprehend that, although these feelings may exist and have full scope in the soul, they can never be adequately expressed or made palpable to the corporeal senses. While Ideality ever soars towards perfection, the material media through which its impressions must be conveyed, being necessarily imperfect, intercept its loftiest flights, and force the half-enfranchised fancy back to earth. The two antagonist principles, the

ideal and the material, thus maintain a continual struggle : and although neither can ever gain the victory, whether in minds the least or the most imaginative, yet by a compromise, a kind of tacit agreement that the one shall be carried no farther than is consistent with the essence of the other—that each shall waive a certain portion of its claims to supremacy—much that is excellent may be achieved, much which, if it reach not, may yet be supposed to give some idea of, perfection. In art, the more the principle of ideality or perfection is fostered and brought to bear upon real existences the better is the purpose attained for which all art exists. Science searches out realities and the mode of their application, art strives unceasingly after ideal perfection ; the observing and reasoning faculties may, therefore, be said to be the soul of the former, Ideality —the intuitive presentiment of an eternal and perfect state—that of the latter.

Constructiveness, the next faculty to be noticed, is common to all animals. Among the lower animals the Beaver, the Bee, and numerous species of birds, afford striking examples. With man in a savage state the erection of the log-hut is, perhaps, its first manifestation ; but with the increase of civilization it finds scope for more varied action than in erecting shelter against the elements. Manufactures, arts, sciences, are all indebted to this faculty for much which, without its aid, they could not accomplish. In Music it produces and takes delight in contrapuntal difficulties for their own sake, heedless of the good or bad effect produced by their elaboration. Of this false taste the sacred works of the fifteenth and part of the sixteenth centuries afford striking examples ; whose sole merit consists in the mathematical exactness with which they solve musical problems. When the true nature of art became better understood, difficulties of construction were no longer regarded as an end, but as a means ; and Constructiveness, when thus limited to its proper sphere, and co-operating with the other faculties, not only affords them material assistance, but may fairly be said to produce a pleasure of its own. Thus, in listening for the first time to the sublime chorus "Cum sancto Spiritu" in the *Hohe Messe* of Sebastian Bach, we receive intense gratification ; but on a second hearing, after having studied the vocal and instrumental score, our pleasure will be greatly augmented by the insight which we have obtained into the construction of the piece, although in both instances our ears have received the same impressions. It appears, then, that this faculty, acting in proper combination with the others, gives rise to a gratifi-

cation *sui generis*, and not, as is the case with them, to one arising from the stimulus afforded by *Tune*, as the fundamental faculty.

The four faculties already enumerated are so essential to Music that, by taking away any one, scarcely any thing remains worthy of being called a composition. We now come to others which, however they may elevate, refine, and delight, are rather to be viewed as producing differences of style than as contributing to the component parts of music.

At the head of these stands *Veneration*, whose function it is to produce respect and reverence towards any being, person, or thing, superior, or supposed to be superior, to ourselves. It has impelled men, in all ages and in all countries, to seek objects of worship, too often without subjecting to the scrutiny of reason their claims to adoration. In those benighted lands where the Creator was unknown it drove them to prostrate mind and body before some physical existence, whose qualities seemed to render it his most fitting representative. Even among the chosen people of God, such was the over-activity of this feeling that, not content with the peculiar privilege of direct communion with their Maker—not satisfied with rendering homage where alone it is due—they were ever relapsing into the idol worship of surrounding nations. The abuses of misdirected veneration meet us at every step in perusing the records of ancient history; nor have modern times escaped the evils consequent upon excessive and misapplied devotion. As the Jews were dissatisfied with a pure theocracy, so were Roman Catholics with the simple religion of the New Testament. They, too, must have their images; the Virgin and the saints were invested with supernatural powers; bread and wine were deified; and the pope was gifted with infallibility! But, while we point out the mote in our brother's eye, let us beware how we remain unmindful of the beam in our own. Are we, in our age and country, free from the reproach of idolatry? Alas! though under a different aspect, it still prevails among us. We no longer bow the knee before a golden calf or carved image, but we prostrate the spirit before opinions, forms, and observances, in reverencing which we fondly imagine we are rendering to the Almighty acceptable service. The legitimate object of the faculty of Veneration is the adoration of the Supreme Being, and when directed into this pure channel it can scarcely be carried to excess.

Again, when we are told that musical festivals are displeasing to God, and that all who attend them are breaking his laws, while

every one staying away performs a laudable act of self-denial; if, instead of examining by the test of our own reason whether the action reprobated may not only be innocent, but even praiseworthy, we take its sinfulness for granted; if, instead of trying the question on its own merits, we seek for palliations, excuses, or benefits, which may, in some measure, counterbalance the supposed evil; we then suffer human authority to usurp the power to which no man can justly lay claim—that of arbitrarily enforcing on others his own standard of right and wrong. Lest our readers should suppose that, in the instance of festivals no one could be found to follow so imbecile a course, we can assure them that we have perused more than one notice of the Birmingham meeting in which the writers, while professing to be friendly to music, regret that an object so pure as the charity should be forwarded by means partaking of sin! Our opinion of charities we have already stated; let us now show that the opponents of sacred music are, through their ignorance of human nature, actually opposing their own avowed object, the spread of true religion and piety.

For the benefit of such cavillers, we beg to state that a large proportion of the pleasure derived from sacred music is caused by the operation of *Veneration* and *Wonder* (the faculties which give the instinctive knowledge of the Deity and the desire to worship him); and if Ideality throw her glowing mantle over the mingling vibrations, what reason can be adduced why those to whom the talent is given should not impress upon tones the same attributes which awe, and at the same time delight, the soul in the Psalms and the Book of Job? Who was ever absurd enough to maintain that the sublime poetry of the sacred volume withdraws the attention from the simple idea? and that, in perusing the Bible, we are delighted, not with the truths it inculcates, but only with its figurative language and lofty imagery? The example of the inspired writers should teach us that the surest means of diffusing religion and piety among the mass of mankind is to press each vagrant feeling into the service of the Creator, and thus fan the too often dormant spark into an enduring flame not to be quenched with this mortal existence, but destined to burn with ineffable splendour through the vista of eternity. How many who repair to the house of worship with spirits harassed by the troubles of the world or deadened by its cares, feel, through the soothing and elevating influence of sacred harmony, their souls attuned to prayer and praise? And what if the "high embowed roof," underneath which we assemble to partake of the intellectual banquet, belongs to a building unconsecrated by man?

We are told that "God dwelleth not in temples made with hands," and that times and seasons are alike to him. On what ground, then, shall weak and erring man arrive at the conclusion that the intense and varied emotions which agitate the bosoms of assembled multitudes as the mighty wave of sound bursts over their awe-struck souls, are polluted in themselves and unpleasing to the Deity?

We have already mentioned *Tune*, *Time*, *Constructiveness*, and *Ideality* as essential to the production and enjoyment of music; we have dilated on *Veneration* and *Wonder* as giving rise to the highest walk of the art, to that which is alone worthy to be employed in the praise of the Creator, as forming the broad line which separates sacred from secular music; we may now add *Adhesiveness*, *Cautiousness*, *Combativeness*, and *Destructiveness* to the list of faculties which find exercise and gratification in music. On these we shall not now enlarge, since in sacred and secular music they are at best only of secondary importance.* We think, however, we have satisfactorily demonstrated either that the Creator has endowed matter with several superfluous properties, and man with numerous unnecessary faculties (a supposition too much at variance with reason and experience to be for a moment entertained); or that it is incumbent upon man to take advantage of those properties, and employ those faculties for his own improvement and happiness. And, to revert to the principle from which we started (that an art is worthy of cultivation in proportion to the faculties it employs), we have also proved that Music is entitled to rank among the noblest pursuits which can engage the refined and the intellectual. It only remains, then, to consider the means best calculated to diffuse musical knowledge among the people.

The late celebrated phrenologist, Dr. Macnish, was of opinion that England would never produce composers equal to those of other countries—never acquire that enthusiastic admiration for works of genius which distinguishes the inhabitants of Germany and Italy. We think that he, in common with many other phrenologists, underrates the influence of cultivation on the fine arts. Whatever natural talent for Music or for Painting an individual may possess, he can neither excel in those arts himself, nor duly appreciate the works of others, without long-continued study of their principles and familiarity with their practice. No one is born

* It is proper to mention, however, that *Cautiousness* is thought, by some phrenologists, to have part in producing the feeling of the sublime: with what justness we are not at present prepared to decide.

with a taste for Handel's choruses or Raphael's Cartoons: the properties which have led the world to admire them are not to be discerned without deep reflection and sedulous cultivation. Here, then, we at once perceive the advantages which Italy, Germany, and France enjoy over England. In Germany, especially, the people live, as it were, in an atmosphere of music. Every child being taught the notes at the same time with the alphabet, with a view to singing at sight, or playing so as to take part in a quartet, it may naturally be conceived that the expense and trouble of getting together an orchestra and chorus capable of performing a grand work is there comparatively trifling. Hence, what in England costs a gigantic effort to accomplish, is in Germany an every-day occurrence. Whilst, at our festivals, the performance of the Messiah affords a never-failing source of self-satisfaction and self-gratulation, every German town containing above 20,000 inhabitants has its *Sing Akademie,* which, without any foreign assistance, produces the master-pieces of Bach, Handel, Mozart, Spohr, &c. Thus, while our ideas of art are confined to a few hacknied compositions, our neighbours become familiar with its whole range. Until we attain to this familiarity, our judgment and our taste will continue as they at present are, narrow, prejudiced, and one-sided. With this view let music be rendered as cheap and as widely diffused as possible; let the prices of admission to musical festivals be lowered, and let them occur much more frequently. The present charge of from 15s. to £1. 1s. for a single performance is exorbitant, considering that 5s. would be amply sufficient to cover all reasonable expenses, besides leaving a surplus for future contingencies.

The benefits resulting from such an arrangement are more numerous than might at first sight appear. In the first place, the important admission would be gained that Music is worthy of cultivation for its own sake; that, being in itself pure and holy, it needs no apology, no palliating accessories, and no shuffling excuses in justification of the pleasure it affords. The reduction of the price would make it answer to hold the festival annually, and thus enable the directors to bring before the public a far wider range of excellence than is practicable or judicious in a triennial meeting. Those who object that the public would thus become "satiated with music," take for granted one of two untenable propositions; either that music is only attractive while new, or that, if intrinsically pleasing, it becomes less so on familiarity with and knowledge of its effects. With persons holding such opinions it were waste of time to argue. We recommend them to go forth into the world,

and "lighten their darkness" by observation, before they thus venture to expose their ignorance. Were the performances annual, it would not only be allowable, but proper, to admit the works of second and third-rate composers. Cherubini, Schneider, Ries, and Neukomm would then meet with a verdict far more proportioned to their merits than can be the case whilst they are occupying the time which ought to be devoted to Bach, Handel, Mozart, and Beethoven. Thirdly, It would enable those of moderate fortune to cultivate the sense of the sublime and the beautiful without incurring an expense inadequate to their means. Lastly, The community would become more conversant with the higher walks of music, would form far juster conclusions of what art really ought to be, would estimate the petty accomplishment which now passes for Music at its proper value. The wretched songs, waltzes, and variations, now the staple commodity of music-shops, would be discarded with disgrace, from a conviction that the pleasure they yield is derived from inferior faculties only. Men would look back on the fashionable favourites of the present day with the same contempt with which they now regard the toys and the recreations of their childhood. When the true meaning of a work of art begins to dawn on their minds, they will bestow their admiration on the genius of the composer, instead of gazing in stupid astonishment at the harliquinades of the performer.

In criticising the late Birmingham festival, the first point upon which we shall animadvert, is the disproportion between the vocal and instrumental talent and the music which they were assembled to perform. No expense was spared to render the band and chorus as complete as possible; the principal singers were among the first which the world can produce; in short, as far as regards the material arrangements, we have but little fault to find.* But where were the great works, the poetical creations, the *mind*, whose expression might worthily employ this great multitude? With the

* We cannot, however, allow the non-engagement of Braham to pass without a few words of comment. It has been rumoured that the terms demanded by this unrivalled master of sacred song were exorbitantly high. That the amount might be large we can easily conceive; but we are at the same time convinced that his services would have outweighed those of Grisi, Albertazzi, and Tamburini; and surely he would have been satisfied with a recompense more moderate than the united salaries of these three distinguished singers. In an oratorio, the latter are, from their training, comparatively inefficient; they contribute but little to the artist-like production of a great work: Braham, on the contrary, is unrivalled in bringing out the mind of the master.

exception of the Messiah, we seek in vain for the splendid manifestations of genius which have from time to time appeared above the musical horizon. For what purpose do we attend musical festivals? Surely not merely to listen to the symphonious accordance of numberless instruments: if so, why ridicule the taste of the Turk who thought the tuning the best part of the concert? Neither is it to lower our standard of excellence by listening to works of second and third rate merit, when we might be drinking in with our ravished ears the highest productions of genius. Is it not, rather, for the opportunity they afford of holding communion with minds superior to our own—minds so pure, so exalted, so imbued with the spirit of poetry, that, to use the expression of Sir J. Reynolds, "we feel a kind of self-congratulation in knowing that we are capable of the feelings which they are intended to excite?" But when we commence the descent—when we begin to allow common mortals to appear heroes in our estimation, we shall find ourselves, ere long, groveling in the regions of mediocrity, and regarding with astonishment the performance of pigmies. *Onwards and upwards* should be our motto; superlative, not comparative, excellence our desire. Such considerations would appear to have had no influence with the directors of the Birmingham festival: *their* aspirations seem to have been after novelty, not after excellence. With regard to the *Ascension*, it might have been supposed that the fate of *David* would have operated as a sufficient warning against ever again admitting an oratorio by Neukomm, even to those utterly incapable of forming a correct estimate of the work from their own judgment. In bringing forward the *Triumph of Faith*, had the occasion been less serious, one might have imagined that the directors had been desirous of playing off a joke upon both the performers and the audience.

Upon works such as these, detailed criticism is thrown away, for no one will read an analysis of what no one admires, and the beauties are too few, the defects too numerous to render the task either pleasing or profitable. Let us speak, then, of Mendelssohn's *St. Paul*, which, in the absence of a greater work, may be regarded as the principal feature of the festival. This oratorio has been likened by some critics to those of Handel; by others, equally without reason, to the sacred works of Sebastian Bach. With neither of these great men has Mendelssohn, so far as we can perceive, much similarity, either as regards the grandeur and originality of their conceptions, or the mode of carrying those conceptions out The general characteristic of Handel's style is massive simple grandeur. Instead of employing a number of smaller impressions to produce one

great homogeneous whole, he takes the hearer, as it were, by storm. His pre-eminence consists rather in his entire and *instantaneous* command over the feelings and emotions, than in the power of keeping them enchained at will during any considerable period. In his choruses he seldom adheres long to any particular idea, but makes each derive a great part of its effect from contrast with the preceding. In this contrast—in this intuitive knowledge of what and where to contrast—lies one principal cause of the immense hold which these compositions have maintained, and ever will maintain, on the public mind. It is disagreeable to the greater part of mankind long to follow out one idea, and to develope all its capabilities; any new idea, therefore, which prevents the necessity of doing this, is hailed with greater delight than if presented simply on its own intrinsic merits. And, undoubtedly, the composition where each idea is good in itself—where each is so placed as to stand in striking contrast with, and to afford agreeable relief to, the succeeding—and where their combination fulfils our conceptions of musical symmetry, is a high achievement of art. But it is to the master-works of Sebastian Bach that we must turn, would we contemplate excellence far surpassing this both in kind and degree. Bach is, perhaps, the only composer who has never submitted to the smallest compromise with the public taste—to the slightest modification of his own exalted ideas to suit the fancy of the impatient and uninstructed multitude. To him, therefore, are we indebted for the only true foretaste of what art is destined to produce when its capacities and ends are better understood than, at the present day, they unfortunately are. For an account of some of his works and an analysis of his style, we may refer the reader to the last number of *The Analyst*. If the estimate there formed be just, and if Handel be the "giant" the world imagines him, then have the critics of Mendelssohn awarded him higher praise than they perhaps intended, in pronouncing him "imbued with the spirit of Sebastian Bach," and in declaring that he is "often Handel himself." No assertions can be more contrary to truth.

On the other hand, it would be extremely unfair to make a composer's first great work the test of his abilities, or of the excellence to which, by study and experience, he may hereafter attain. We know not which is the more injurious to the interests of art—to expect a young composer at once to reject all previous models, and burst forth to the world with innate originality, or to place his first necessarily imperfect efforts on a level with works which have passed triumphantly through the ordeal of time. Take three of

the greatest musical inventors—men who have explored paths previously unknown or untrodden—Bach, Haydn, and Mozart. Bach's early compositions for the clavichord were formed on the model of those of Couperin, a fashionable French composer of that day, whose works have long since perished, and whose name would probably have fallen into similar oblivion but for the accidental honour of having assisted in calling forth the latent energies of the mighty master. The first symphonias of Haydn are scarcely to be distinguished from the writings of Emanuel Bach, and Mozart's two first operas were mere essays in the prevailing Italian style of that period. We may, indeed, safely lay down the general rule, that before any man can worthily give utterance to original conceptions, he must first be able to do well what others have done before him. From such preliminary training the highest powers afford no exemption.

To form a perfectly just estimate of a cotemporary production professing to be a candidate for immortality, is, of all the labours of the critic, the most difficult properly to fulfil. Hard, indeed, and requiring no ordinary discernment, is the task of determining how far a work of art is indebted for present popularity to its conformity with existing tastes and prevailing modes of thinking, and how much to the forcible appeal which it makes to the eternal feelings and passions of the soul, in contradistinction to their temporary and accidental modifications. In criticising a recent work, we may avail ourselves of our acquaintance with the master-pieces of former times, and compare the means by which they attained to excellence with those employed in the present instance: it is evident, however, that this mode of judging must (from the nature of the fine arts, and more especially of Music) be extremely defective, and become liable, in the hands of the bigoted and pedantic, to act as a drag on further progress. Genius spurns the shackles of precedent; it pursues its course, heedless and independent of other men's ideas; it dwells not on the memory of the past, but penetrates into the mysteries of futurity, and is, therefore, beyond the comprehension of ordinary minds, ever prone to cling to the trivial forms and conventionalities of the petty sphere in which they move. In forming, then, an opinion of cotemporary works, we should eschew with equal care an over-reverence for the past and that narrow-mindedness which dwells only with complacency on the productions of the present; and should endeavour to hold the scales with impartial hands, attributing merit where merit is due.

All great composers—all who, in their ideas and their manner of

expressing them, advanced beyond the age in which they lived—have displayed their greatness in vocal as well as in instrumental writing. Many there are, doubtless, of respectable merit, who have confined themselves to the one or the other of these departments; such, however, it will be found, are not entitled to rank as inventors in the highest sense of the word. They are either polishers, or else mere followers. In the first class we would place Correlli among the instrumentalists, and among vocal writers Sacchini; in the second Geminiani and Tartini, together with the host of glee-writers and many of the compilers of anthems, whom English pride regards with affection more fond than judicious. If we try Mendelssohn by this test, we shall be compelled to refuse him that exalted rank to which his admirers would persuade us the oratorio in question entitles him. Throughout the whole of *St. Paul* we perceive with regret an almost total want of that vocal excellence, that luxuriance of melody, that "linked sweetness long drawn out," which, in the works of the three great composers above-named, so forcibly arrests the attention and enchains the soul, and which, even in their instrumental writings, forms, perhaps, one of their greatest charms.

The overture to this oratorio is, perhaps, that part which is most complete as a whole, and most calculated to give satisfaction to those who desire unity of design and treatment in a musical composition. It opens with a very solemn and impressive slow movement on the subject of the *choral*, "Wachtet auf, ruft uns die Stimme," in the body of the work. This is followed by a fugue in triple time, on a very elegant subject (taken from the same choral), treated in a manner much more masterly than those which are made the foundation of any of the subsequent choruses. Indeed, it is on this overture, as well as on his other instrumental works, that we principally rest our hopes of seeing an oratorio by this composer the *vocal* excellence of which shall far surpass that displayed in the present, and the want of which is, in our opinion, its great, its overpowering defect. Thus, in the song "Jerusalem, Jerusalem!" the interest lies entirely in the instrumentation and modulation, while the notes given to the voice form a mere apology for a melody without the slightest pretensions to *air*, or even to novelty. The same is the case with the bass solos "Vertilge sie" and "Gott sei mir gnädig;" in a remarkable degree, with the duet "So sind wir nun Botschaften" and "Dann also hat uns der Herrgeboten," with the difference that the sterility of melody communicates itself, in these two instances, to the accompaniment, which is bald and commonplace.

The triviality and want of dignity in the subjects of the fugues is seldom compensated for by a full display of their capabilities, or even by an ordinary skilfulness of treatment; and the winding-up is effected, not by their complete development, but, on the contrary, by a return to the plain, note-against-note counterpoint, to which this composer seems so devotedly attached: witness the choruses "Mache dich auf, werde Licht," "O welch eine Tiefe des Reichthums," "Denn alle Heider," in which, even in what may by courtesy be termed the fugued parts, the composer often relapses into his darling plain counterpoint, and the concluding chorus "Nicht aber ihm allein," in which a pitifully mean subject is handled in a manner very different from what is expected from one "imbued with the spirit of Sebastian Bach." The chorals so plentifully interspersed throughout the oratorio are good, but not Mendelssohn's, as any one may satisfy himself by glancing over any collection of psalm-tunes used in the continental Lutheran church. We have hitherto only spoken of what we consider the defects of this work: its beauties are neither few nor difficult of discovery. The instrumental writing is, in general, as rich and characteristic as the vocal is meagre and commonplace, and displays considerable knowledge of orchestral effect, as well as boldness and freedom of fancy. We may mention as examples the choruses "Herr du bist der Gott," "Wir preisen selig," "Ich danke dir Herr," and "Wie lieblich sind die Boten." The recitatives are, in general, well-declaimed, and provided with appropriate and often bold harmonies. But hardly any degree of excellence in other points can atone for a general poverty—we had almost said absence—of *melody*, the necessary element of all harmony worthy of the name. Our opinion of this work, then, taken as a whole, is that its want of individuality, of the marks of true genius, inventive power, grandeur and elevation of thought, and more especially of original and flowing melody, will effectually debar it from enduring fame, perhaps even from temporary popularity; that, although displaying far higher genius than such works as *The Ascension* and *The Triumph of Faith*, it nevertheless falls short of that magnificent power which moves at will the passions and the feelings of men, and holds them willing captives in the regions of ideal beauty or superhuman sublimity; which is as mighty to-day, to delight and to awe, as it was ages ago, and as it will be for ages to come, so long as human passions and human feelings remain to bear witness to, and bow before, its sovereignty.

We consider the total neglect of Spohr a by no means venial er-

ror of the festival directors. Why should they not have produced the entire *Crucifixion*, in order to give the public an opportunity, for the first time, fairly to judge of and appreciate its undeniably great beauties? The production of such a work would have redounded equally to the credit of the festival and to the gratification of the public.

But of the treatment of Sebastian Bach, we can scarcely think or speak with any degree of patience. It was alluded to in the last number of *The Analyst* in terms of strong animadversion, but we never expected to witness anything half so injudicious as the manner in which this great man was for the first time introduced to the public as an oratorio composer. When are we to see the end of these eternal selections—of this tearing out a leaf in order to give an idea of the scope and tendency of a book—which, when applied to a great work of art, which must be heard and studied *as a whole* in order to understand in all their grandeur the sublime conceptions of the master, are in the highest degree absurd? We do not disapprove of selections in every case, provided they are made with judgment and in a spirit congenial to that of the author. Indeed (considering the rarity of musical festivals), they are absolutely necessary, unless we would restrict ourselves to the works of one or two masters. But there are some works of which the most judicious selection can never give an adequate idea; and such, if they cannot be performed entire, should not be performed at all. Such a work is the *Passions-musik*, which we fear, even if done ample justice to in the performance, would not meet with a responsive echo in a Birmingham festival or in any English audience equally large and equally promiscuous. Every one can admire the simple and massive grandeur of Handel's "Hallelujah" chorus: to a few only is as yet revealed the true meaning of the glorious conceptions contained in Bach's gigantic and eternal harmonies. It behoves, then, those who cater for and, at the same time, by producing the works of a great composer, hitherto unknown, desire to improve, the public taste, to use great discretion in their choice. They must not rest satisfied with indolently confining their researches to the works of which common report speaks the most highly; they must not present a disjointed fragment (and in a minor key, too!) as a specimen of the whole, or of the composer's powers; nor must they be astonished, or impute it to the bad taste of the public, when their injudicious and abortive efforts utterly fail of attaining their end. This, however, *was* the course pursued at Birmingham: on those who follow it rest the blame and the disgrace. At the next festi-

val, as some atonement for their past misdeeds, we suggest the propriety of giving Bach a "fair trial." Let them produce the *Hohe Messe* (Grand Mas) in B. minor ENTIRE. If they can once bring up their courage to the "sticking pitch," if they can once throw aside slothfulness and foolish fears, they may, by so doing, earn for themselves the sincere and heartfelt gratitude of all real lovers of music. Or, if such an effort be too great for them, they may produce one of the numberless motetts and sacred cantatas of this composer; and thus, if unmindful of the glory of being the first to bring forward one of his *great works*, may at least escape the disgrace of again mutilating them.

It will not do here, to plead in excuse that the piece selected was only by way of experiment, that a longer work might have disgusted the public, and that, if successful, it would be time enough at the next festival to produce something more complete. The result of *such* an experiment every one not blinded by self-interest and prejudice must have foreseen. It was like trying an accused person with a predetermination to condemn him; bringing up all the witnesses against him, keeping back those on his side, and listening only to the counsel for the crown. In the present instance the subject of experiment, say rather of condemnation, was a piece in a *minor key*, severed from its connection with the rest of the masterwork in which it stands, one of whose many transcendent merits consists in the intimate, though not at first discoverable, relation in which all its parts stand to one another, in the beautiful binding together of each piece, so as to form one perfect and indivisible whole. Those who, in thus mangling the works of genius, show that they have no higher notion of art than as a momentary gratification of sense, who would convert an oratorio into a selection of favourite airs and choruses, who can see no link of connexion between music separated by double bars, and who would bring others down to *their* bounded ideas of excellence, are unfit for their responsible office.

But a truce to fault-finding. Let us suppose the directors willing to attend to any suggestions which may have the effect of raising the character of the meeting whose interests they wish to advance. Suppose they put the question to us, What steps would *you* take to advance the art whose welfare you so warmly advocate? We answer, Seek out excellence where most it abounds; heed not whether a composer be celebrated or unknown, ancient or modern; suffer not yourselves to be dazzled by the false glare and ephemeral excitement which attends the production of a foreign work in presence of its author; satisfy yourselves, by diligent research, when

and where the high style, which it is your duty to bring before the public, prevailed; and having formed your conclusions fearlessly carry them out into practice.

The oratorio is the highest walk of the art. This epic branch seems to have arrived at perfection about the end of the seventeenth and the beginning of the eighteenth centuries. Previous to that era it was not sufficiently dramatic, and subsequent to it became too secular. In the masterpieces of that period we find the sublime, the beautiful, and the ornamental styles, each in due proportion; the sublime taking the precedence of its humbler rivals. We have here another proof that the feeling of the sublime is intrinsically the same with that of devotion. Religion was still the main moving spring of the age: no longer, indeed, the religion of cowled monks, chanting solemn requiems in the long-drawn aisle or lonely convent; no longer the religion of penitent hermits or pilgrims, seeking heaven in a renunciation of the world; no longer a religion of feelings and impressions; but one of thought, argument, and conviction, present with the statesman in his cabinet, accompanying the warrior into the battle-field, sending whole tribes into voluntary exile for conscience sake, and hurling princes from their thrones. Similar was the change which came over the spirit of music. The unearthly and purely sublime strains of Palestrina, Bird, Tye, and Tallis, gave way to the "Te Deum" exulting over the fallen foe, and to the oratorio embodying, in the form of a religious drama, the stern martial and political temper of the age.

In accordance with these views, we find that cotemporaneous composers in Germany, Italy, and England, produced works which bear the impress of colossal grandeur. Whatever might be the stamp of their individual genius, the influence of the school in which they studied, or the character of the people for whom they wrote, they never descended from that commanding elevation which has earned for them an enduring name.

Among the writers of this period, then, must we seek for the fittest offerings at the shrine of Veneration, Wonder, and Ideality. And truly that we know but the names of some of the greatest, and of those with whom we are more familiar, only such works as chance has thrown in our way, heedless whether those we neglect be not yet nobler, are facts which say but little for our love of art, of ideality, of proportion. Of Bach, towering far above all rivals, we have already spoken. But Handel, that name "familiar as a household word," what apology shall be indited for his treatment by "the general?" Has he written only *one* great work? "Where is

"Israel in Egypt?" where "Judas Maccabeus?" where "Deborah?" where "Sampson?" where "Solomon?" Slumbering in oblivion, buried under the neglect of ignorance and self-satisfaction. Leo, too, whom Handel himself pronounced the greatest composer of his day, and whose glorious pedal-points stand unrivalled for massive grandeur, must he give place to Neukomm and Häser? Let us hope that at some future period, distant though it be, we may be permitted to enjoy the tender accords of Hasse in his *Betulia Liberata*, and the pathos of Jomelli in his *Requiem* and *Passione*. On turning to the German school, the name of Graun rises up to reproach us for the neglect of his *Tod Jesu* (Messiah), which in Berlin enjoys a popularity equal to Handel's work on the same subject in England. The solo songs, if given by a performer capable of estimating the mind of the composer, would produce a splendid effect. This work abounds in admirable chorales; and we hesitate not to pronounce the fugue "Christus hat uns Vorbild gelassen" superior to any thing which Handel ever wrote in the same style. Greatly would it rejoice us to see this work well-adapted to English words, and to hear it worthily performed by a band like that employed at Birmingham. The *Te Deum* of the same author, composed at the command of Frederick the Great, is replete with grandeur and beauty. The movement "tu rex gloriæ" is remarkable for the bold and sublime employment of double discords; and the whole composition belongs to a class worthy of being produced at a great festival. With regard to Pergolesi, who excels all other masters, except, perhaps, Purcell, in pathetic expression, we should delight to hear his *Mass for Five Voices*, f which the "Gloria in excelsis" is so well known. We throw it out for the consideration of the directors, whether it might not be possible to give it with the Latin words. We are fully aware that this is delicate ground; but as the fragment already mentioned of this work has always been so performed at the Ancient Concerts under archiepiscopal sanction, we think the experiment might fairly be tried on a larger scale without wounding the conscience of orthodoxy. We are convinced that the mediocre success of many foreign oratorios which have been lately introduced into this country is attributable, in great measure, to the forced character which must ever attend even the most skilful adaptations. In the mass above-mentioned, we meet with a fugue (immediately preceding the popular "Gloria") to the words "Kyrie Eleeison," and which, for stern solemnity, will scarce find a rival elsewhere. How much more conspicuously will the power and versatility of the composer stand forth, if an opportunity be al-

lowed of hearing these two masterly efforts in juxtaposition than by constantly repeating the last only, as if what preceded was unworthy of notice. With regard to the words, we are at a loss to imagine in what manner "Kyrie eleeison" or "Benedictus qui venit" can give offence to the tenderest consciences.

On the sacred works of Haydn and Mozart we may be expected to say a few words. The readers of *The Analyst* must be aware that we belong to the number of those who for the highest of all subjects require the highest style of art. To term music *sacred* which excites no veneration, is a palpable misnomer. In vain do the words invite to lofty contemplation if the music, in wanton dalliance and sportive fancy, twines, with spell more potent, round the soul its alluring blandishments. If such be its character, the greater the skill of the composer, the more effectually does he frustrate the object for which sacred music is ordained. If there be any truth in the theory we have already laid down and partially illustrated—namely, that music is a mirror which faithfully reflects the character of the age—in the (so called) sacred music of the latter half of the eighteenth century our ideas receive ample confirmation. The papal power, long since divested of its physical terrors, had with them lost its influence over the minds of the greater part of the Christian world. The eyes of those who had blindly confided in the infallibility of the church now began to be opened; intellect once more asserted her rights, reason submitted no longer to be trampled upon by force. But as men are ever prone to fall from one extreme into its opposite, so in the present instance: when the enormous abuses and egregious follies of priestcraft were laid bare, with powerful and unsparing hand, by the French philosophers, so replete with moral deformity, so supported by wilful deception, did the whole fabric appear, that religion herself was pronounced an imposture and cunning device of the learned, to acquire wealth and power by working on the fears of the credulous and the ignorant. The goddess of reason was proclaimed supreme—Alas! that fanaticism should assume that noble name! Aye, fanaticism; for no crusaders ever pursued with more unrelenting hate their infidel foes, than did these *reasonable* men strive to bury, in one common ruin, the noble principle of Veneration and the abuses which the crafty and the designing had wrought under its name. In times like these, when a scoffing demon was let loose upon the earth, when men either abjured all religion or else only professed an adherence to it from motives of self-interest or political expediency, it were idle to expect an art to give utterance to feelings of which the heart

was destitute. In proportion to the contempt into which religion had universally fallen, did the church music of Germany, Italy, and England, degenerate in all which distinguishes the sacred from the secular. Instead of sublimity we find prettiness, playfulness and effeminate sentimentalism, or, if anything higher is aimed at, that dulness which is ever the result of pretence taking the place of reality, as the constant characteristics of the productions of this period. As instances, take Vinci, Galuppi, and Guglielmi, in Italy; Nauman, Himmel, and Weigl, in Germany; Kent, Worgan, and Nares, in England. As choral writers, these are all pigmies compared to their predecessors. Haydn and Mozart, though possessing immeasurably greater powers, escaped not the influence of their age. The *Creation* will live for ever, but its charm lies rather in the freshness of its melodies, and the playful brilliancy of its instrumental accompaniments, than in the sublimity of its choruses; and even these would probably never have been written had not Haydn, during his visit to this country, become acquainted with the works of our church composers and of Handel. His *Seasons*, also composed subsequently to his sojourn here, is not an oratorio, but a dramatic-pastoral cantata, and, considered as such, is excellent.* His masses contain some beautiful quartetts and solos; but the choruses are on two petty a scale, and their whole character is secular, not sacred. As to the productions called Mozart's masses, we are convinced that they are either *not* his, or else that they are early and hasty effusions, giving no juster idea of his style and genius than does *Titus Andronicus* of Shakspeare's. We are the more inclined to this belief as, in the *Requiem*, we see no indistinct traces of the greatness to which this mighty master might have attained in the sacred style had he been spared time fully to realize his conceptions. We are surprised that the admirers of Mozart have not made more strenuous efforts to obtain the performance of this extraordinary production.

Of subsequent composers, with the exception of Spohr, we recollect only one grand work on a religious subject which deserves to live. When we reflect that that work is the production of an Englishman, we blush for the neglect which its author has suffered at the hands of his countrymen. We allude, of course, to the *Palestine* of Dr. Crotch. While numberless critics are enaged in the contemptible task of magnifying mole-hills into mountains, they seem by com-

* This charming production would, if given in the evening, afford a treat worthy of an intellectual audience.

mon consent to suffer the man who, without loosing his individuality, is truly imbued with the spirit of ancient times, to live forgotten and unappreciated by his cotemporaries. *Palestine* is immeasurably superior to most of the foreign novelties which have been so carefully fostered by ridiculously exaggerated commendations. No crude or hasty production, it owes none of its attractions to clap-trap accessories, the commonplace substitutes for genius. The sublimity of the choruses and the beauty of the sextetts, quartetts, and solos strike the mind as forcibly when played on the piano-forte as when rendered by countless voices and instruments, or warbled by the most finished vocalists. Let us not be told that the price demanded by the author is exorbitant. If the plodding labourer is worthy of his hire, if selfish intrigue too often attains its ends, shall genius always be expected to lavish its benefits on mankind and receive no return?

A word concerning the *evening* performances. If in the morning the riches of the ecclesiastical composers of former ages have (or *should* have) awed and elevated our souls; in the evening we expect to be enchanted with the varied beauty and grace of those who have chosen the opera, the symphony, and the instrumental solo as the channels in which to pour forth their ideas. We lose all patience when we reflect on the miserable jumble which selections—not only at Birmingham, but at almost every festival—present. Ignorance and bad taste here reign triumphant. What excuse can the directors, with unlimited national means at their command, bring forward for so deplorable a failure? Their justification may be comprised in three words—*they please their audience.* This lamentable fact it is vain attempting to deny: let us, then, boldly look the truth in the face. It appears that a selection in which a dull glee follows a trashy song, which, in its turn, gives way to variations on the concertina, attracts a larger audience than a succession of the loftiest master-works of Music's most favoured sons. A more lamentable instance of the lower faculties triumphing over the higher it is difficult to conceive. To us, however, far from presenting anything surprising, it only appears a necessary consequence of the present wretched state of musical instruction. As, to the clown, the sign-painting creaking before the alehouse in his native village seems a transcendent specimen of art, so, to the flimsily-educated young ladies and gentlemen honouring these concerts with their presence, do *The Light of other Days* and *Wandering Willie* fulfil their utmost ideas of excellence. So painfully low is their standard, so utterly devoid of ideality are they, that, provided Grisi be

the singer, it is to them immaterial whether the song be *Son' Vergin'* or *Non Piu di Fiori*. Of such, the endeavour to improve the taste is, we fear, useless. The best seed here falls into barren ground, or is blown away by the wind before it reaches it. Let us not, then, throw away our words in the idle attempt: let us rather address ourselves to those who really feel their deficiencies and desire to see the rising and future generations enjoying the benefits of which *they* know only the want.

From our thorough conviction of the high rank which Music holds among human attainments, from our knowledge that the power to obtain a certain degree of proficiency in the art is common to all men, we form the conclusion that it is at present far from effecting the good and diffusing the happiness of which it is capable. How few know what Music is! how many accept the dross for the ore! how many set a higher value on the manual dexterity of the performer than on the mind of the composer! Lamentable, indeed, is the thought that, for the majority, Bach, Mozart, and Beethoven, have hitherto lived in vain; that their brightest conceptions and noblest combinations speak no more pregnant meaning than a succession of chords without connection. It will not, cannot, always continue so; the many have slumbering within them the *power* to appreciate genius; but few only, under existing circumstances, are allowed the opportunity of cultivating the faculties they have received from their Creator. On this universal capacity we found our hopes. From that musical establishment, the profession, we expect little. Its members have their own ends to serve; and as far as their private interest coincides with that of the art by which they live, they will doubtless exert themselves for the improvement of the latter. Beyond this they will not go; nor is it to be looked for. But the gains of the few must not be suffered to oppose the happiness of the many; and we perceive cheering tokens that these are at length beginning to understand their own interest.*

We hope to see the time when the love for the sublime and the beautiful shall triumph over personal vanity and mercenary selfishness—when the meaner feelings which have so long clung to and disgraced the fair fabric of the arts shall no longer bring opprobri-

* We hope, through the medium of *The Analyst*, at some future time, to return to this important subject, and endeavour to point out *the means* by which the imperatively called for improvement in the public taste may be brought about.

um on Music—when it shall have been discovered that for the many *themselves* to waken the slumbering mind of the mighty master, is better than to pay hired labourers for rendering that which when rendered is not understood. We feel that our words will not be wasted; we write with certainty that we shall touch a responsive chord in the bosoms of thousands who, spurning petty vanity and sordid selfishness, actuated solely by a love for art, are applying their energies to its diffusion, and by their exertions affording the best proof that we advocate no idle fancies, no Utopian dreams. The Sacred Harmonic Society, from an humble beginning, has risen to an eminence which the most sanguine among its founders can scarcely have anticipated. The performance of *Israel in Egypt*, Handel's most stupendous work, filled us with hopes for the cause of Music in England. In the *vocal* department they undoubtedly surpassed the paid chorus singers whom, three years before, we had heard perform the same work at Birmingham. How striking, too, was the contrast between that evening's achievement and the threadbare selections and meagre execution of the once-famed Ancient Concerts. Triumphs glorious as these will ever be the result when the many unite their sympathies and their powers. Neither money, nor rank, nor the narrow spirit of exclusiveness can prevail against cordial co-operation. The Sacred Harmonic Society stands on the secure basis of *principles* stable as the laws of Nature and of mind. We beg its members to accept this tribute, in return for the pleasure they afforded us. They are on the right road. May their prosperity be in proportion to their deserts!

Cheering, indeed, is the prospect that the period is approaching when *all* shall labour in the vast field of art with a view to their own intellectual and moral improvement, where *now* a few coldly and inadequately toil to obtain a scanty pittance. The powers of mind and of voice requisite to give an air with effect, may ever, perhaps, remain confined to a few; but the interest derived from even the finest of such exhibitions shrinks into insignificance, compared with that inspired by the choral union of countless voices rolling through the mazes of endless fugue. And when mankind shall have become acquainted with its higher walks—with the deep truths of which it is a "fit embodyment"—how different will be the emotions suggested by the word *Music*, from those raised by the compound of frivolity and pedantry with which it is now synonymous. When a longing for, and admiration of, the noble and the grand shall have replaced that eager and restless desire for trifles which disgraces our age, then will the now hidden treasures of for-

mer times be fully explored and appropriated: Bach, Handel, and their cotemporaries will supersede on every piano-forte the wretched collections of harmonized aids, miscalled Psalm-tunes; and Sunday evening, instead of being the last refuge of dullness, will resound with strains worthy of the object they commemorate, and which will assist in raising the soul to a contemplation of that pure and happy state where beauty transcending far the poet's dream, and harmony more exquisite than minstrel ever wrought, shall reward us for temptations resisted and difficulties overcome.

Y. D. AND T. W.

ABSTRACT OF A PAPER ON THE FOSSIL ICHTHYOSAURUS

LATELY PURCHASED FOR THE BIRMINGHAM PHILOSOPHICAL INSTITUTION,

READ ON THE 1ST OF MAY, 1837.

THE Lias, from which the interesting specimen we are going to describe was taken, is one of the members of the secondary strata intermediate to the oolites and new red sandstone, upon which it lies unconformably, to use a geological phrase—that is, it does not follow, in the planes of its stratification, the elevations and depressions of the upper surface of the sandstone, but fills up the latter, and rests upon the former, in a way that proves that the deposition of the Lias took place long after that of the sandstone. It extends in a broad curve laid across the kingdom diagonally from Lyme in Dorsetshire, through the counties of Somerset, Gloucester, Worcester, Warwick, Leicester, Nottingham, and York, to Whitby. It consists of nearly horizontal beds of white, blue, or blackish limestone, occasionally hardening into marble, and of various thickness, alternating with layers of stiff argilaceous shale or blue clay. Sometimes the beds of limestone contain nodules of the same substance imbedded in clay, that separates them from the surrounding stone; and it was in one of these nodules that the present specimen was enclosed, in a manner to which we shall have occasion to revert hereafter. The stone contains from sixty to ninety per cent.

of lime, the residue being alumina and oxide of iron, which give the mortar prepared with this lime the important property of hardening under water. It is a marine formation; and, besides the bones of Ichthyosauri and of other saurian animals, it abounds in the remains of fishes, crustaceous animals, and mollusca, particularly of gryphææ and ammonites; and fragments of carbonized and pyritous wood are frequently found, both in the stone and clay. Parts of the strata constituting the Lias are much impregnated with bitumen, so as to have led to their being worked for coal; and where this occurs in conjunction with pyrites, as at Whitby, vast quantities of alum are procured from the decomposition, by spontaneous or artificial combustion, of these substances. From the great regularity and evenness of the beds of stone and clay, whose inclination is not more than forty feet in a mile towards the south-east, as well as from their nonconformity with the new red sandstone, it is evident that this was in a quiescent state at the time that the Lias was deposited over it; and the general absence of fragments of rocks or stones in the Lias strata would lead us to the conclusion that this formation also was the result of causes acting, not with violence, but continuously, did not certain circumstances connected with the distribution and state of preservation of the organic remains, tend to induce a belief that catastrophes, of sufficient force not only to cause the death of the inhabitants of the deep, but also to produce their speedy interment in the mud and oose at the bottom, were not of unfrequent occurrence at this period.

The Lias at Barrow-upon-Soar, in Leicestershire, where the present specimen was found, presents a remarkable regularity and correspondence in the thickness of the layers of limestone and clay, the former being usually ten inches, the latter eighteen inches, thick. The dip is but slight, amounting only to an inch in a yard to the east, although Mount Sorrel, a sienitic rock and the first of a range of primary rocks extending over the forest of Charnwood, is in the immediate vicinity, being only separated by the little stream of the Soar and the meadows through which it flows, from the out-crop of the Lias on the opposite bank.

The nodule that contains the Ichthyosaurus, however, did not lie in one of these beds of stone, but in a stratum of reddish clay above them. When entire, it was nearly six feet long and two feet wide, and about seven inches thick, having the general form of a fish deprived of its tail. It was broken into several portions by removing it from the quarry, and the parts containing the end of the nose and part of the tail were lost. It is formed of a series of concentric

layers of limestone, increasing in hardness and crystallization, from hardened clay on the surface to perfect marble at the centre. When brought to Birmingham, a stone-mason was employed to chip off the stone from one side, so as to bring the enclosed skeleton into view; and then it was discovered that portions of the paddles, and the extremities of some of the ribs were wanting, in consequence of their passing quite through the stone. Mutilated, however, as it is, it is one of the most perfect specimens of the Ichthyosaurus as yet discovered, and is a very valuable addition to the collection of the Institution.

As now displayed, the animal is lying on its right side, with the paddles extended laterally, and the head, dislocated from the neck, resting on its upper part. But the description of the injuries it has sustained is better reserved for the place where we shall attempt to explain their cause; at present our object is to describe the peculiarities of the structure of this class of animals by their analogies among still existing races. In external form the Ichthyosaurus partook of the appearance of the Crocodile and Lizard tribes and of the Whale; of the former in the shape of the head, body, and tail, and of the latter in the form of its anterior paddles, that closely resemble the fins of the Whale, and in the want of scales or any external bony defence. But in imposing the name Ichthyosaurus, or Fish-Lizard, Mr. Kœnig seems to have fixed his attention upon the form of the vertebræ, which closely resemble those of the fishes. In size the Ichthyosaurus far exceeded the recent Crocodiles, being sometimes thirty or forty feet in length, of which the head forms a very variable proportion, from the difference in the length of the jaws in different species.

Dr. Buckland, in his Bridgewater Treatise, has given a plate of the petrified skin of the animal; but though we have not been able to discover any thing exactly similar in the present specimen, yet there is a thin film of carbonaceous matter that pervades the stone in such situations as we should expect to find traces of this membrane. Between the ribs a large surface of some thickness of this matter is apparent, having a lamellar and crystalline structure, that we may, with some reason, conceive to be the remains of the flesh and viscera. There is also a white calcareous substance lying upon the ribs, on their abdominal surface, and near the carbonaceous matter last described, that, with still more probability, may be referred to the excrements, which, consisting chiefly of the indigestible portions of the bones of the fishes and other matters that served for its food, would not be unlikely to

contain a large proportion of lime, in the form of phosphate and carbonate. The rarity of coprolites at Barrow, and their abundance at the mouth of the Severn, may be referable to certain differences in the nature of the food of the Ichthyosauri in these localities, that which contained the greatest proportion of bone and calcareous matter, affording, of course, the largest quantity of coprolite.

The structure of the head, teeth, and jaws, closely resembles that of the true Crocodiles, as distinguished from the Alligators. These are piscivorous, and, like the Porpoise, have their lower jaw in a single piece; but the Crocodiles, being bolder animals, and attacking their prey either on land or in the water, require a stronger construction of the two lower jaws, which, in order to fulfil this design, are composed of six bones on each side, so spliced together as to give the greatest degree of lightness and firmness combined. The number of teeth, which is about one hundred and eighty, is greater than in the Crocodile; and they are not enclosed in sockets, but lie in a groove of the jaw. As this structure renders them insecure, and liable to be displaced, in order to replace those that are broken or torn out, a constant succession of teeth is provided, that lie in a depression in the side of each of the old ones, which they push out by their growth, unbroken; whereas the new tooth of the Crocodile, being contained within the old one, splits it before it expels it from the jaw. The teeth and jaws form, at present, the specific distinctions of the Ichthyosauri; thus, we have the Platyodon and the Tenuirostris, &c.; but Mr. Hawkins and Mr. Owen consider that the paddles present more unfailing characters for the establishment of species. The nostrils, being placed almost immediately in front of the eyes, indicate that, like the Pike, the Ichthyosaurus fished by sight rather than by scent, and was probably equally voracious as that fish. Indeed, if we may reason from the size of the eye, which is very large in most predacious animals, it must have been the tyrant of the deep; for these organs are larger, in proportion to the head, than in any other of the finny tribes, except in a few of the smaller fishes. The sclerotic coat of the eye was composed, as in birds and crocodiles, of bony plates, that, ranged in a circle like the staves of a barrel, and being movable over each other, by their contraction and expansion increased or diminished the axis of the eye, and altered its range of vision from near to distant objects in air or water, according as the huge monster floated on the surface or remained sub merged; when, by the immense quantity of light admitted through the enormous pupil, the deepest recesses of the ocean, or its most turbid water, were subject to its ken. Although the structure of

the jaws and teeth indicate great strength and voracious habits, yet this voracity must have been confined in its exercise to preying upon marine animals; for the remarkable flexibility of the skeleton of its body deprived it of the power of moving upon land, except in a very limited degree. First, the head was fixed to the neck by a ball and socket joint, the most movable of all articulations; next, the vertebræ, or joints of the back bone, were from forty to fifty in number, and instead of being connected together by broad flat surfaces, as in land animals, only touched at their edges, like those of fishes; and the spinous processes, instead of forming a single piece with each vertebra, were jointed by their bifid roots into two holes, one on each side of the groove down which the spinal marrow ran. The paddles, also, consisting of numerous flat polygonal bones, ranged in a tesselated manner, were quite inadequate to the support of the Ichthyosaurus on land, though most powerful organs of motion in the water.

The ribs, equal in number to the vertebræ of the body, extended from the head to the pelvis, as in certain Lizards; and about twenty of the upper ones were lengthened by what Mr. Conybeare terms the sterno-costal arcs, which were a set of bones, five in number, attached to each pair of ribs, that, in a manner resembling the stretchers of an umbrella, enabled the animal to extend and contract the dimensions of its chest to a degree to which we see nothing analogous among existing races of animals. In the Crocodile, however, whose sternum is prolonged to the pelvis, there is a set of intermediate bones, between the true ribs and their cartilages, that are connected to the sternum, which probably answer the same purpose.

The Ornithorhynchus, while seeking its food among the weeds at the bottom of the streams in which it dwells, is frequently obliged to rise to the surface to respire: it also burrows in the banks, like a Water Rat; and hence, in order to increase the strength and elasticity of its fore legs, a bone, similar in form and function to the furcula or merry-thought of birds, is introduced between the breast and shoulder bones, to which it forms a most elastic *point d'appui*, while it keeps them apart, and antagonizes the powerful muscles that move the anterior extremities. Sir E. Home, in his *Lectures on Comparative Anatomy*, has given a representation, which Dr. Buckland, in his Bridgewater Treatise, has copied, of this peculiarity both in the Ornithorhynchus and Ichthyosaurus: but in the specimen we are describing, the flat central portion of the furcula is wanting, which arises, probably, from the bone having retained its cartilaginous state at the time of the animal's death—a supposition

that is supported by the want of the rounded knuckle in the humerus or arm-bone to fill the deep socket in which it was lodged.

The hind paddles are of the same shape, but are much smaller than the fore, and their terminal bones are lost. Of the tail, there are only a few joints remaining: but, judging from the increasing size of the vertebræ from the head to the pelvis, and by comparison with other specimens, we may conclude that the tail, when entire, was nearly as long as the body and head together. Its transverse processes are jointed to the spine, and the spinous processes are very broad and strong, indicating great power in this organ, as is observed in the Crocodile, with considerable extent of lateral motion, as in fishes.

The specific characters of the present specimen do not correspond to those of any of the species hitherto described. In the paucity of its paddle bones it resembles the *Ichthyosaurus platyodon* of other geologists, and to the *I. chieroligostonus* of Hawkins; but it differs from it in the pointed form of its teeth, and in the number of its dorsal vertebræ, that amount to forty-eight or fifty, whereas the vertebræ of the *I. platyodon* are only forty-four. It must, therefore, be considered as a new species; and we would suggest the name of *I. macrorachis*, as indicating its peculiar length of spine.

Besides the loss of the tail, and of the extremity of the nose, paddles, and of some of the ribs, the specimen presents the following injuries:—the crown of the head is crushed flat, the bony plates of the eyes are separated and dispersed, the jaws are pushed in contrary directions, and one of the bones constituting the right side of the lower jaw is broken. In the neck and back, the vertebræ are turned upon their axes, so that every rib is dislocated from its attachment, the ribs of the left side of the neck being thrown in a bundle forwards, while those of the body are very regularly disposed over the spine, with their heads in contact with the spinous processes, and their shafts lying diagonally across the right ribs that remain in contact with, though disjointed from, the spinal column. Wherever one bone has rested upon another, the superincumbent pressure has been sufficient to crack and break the upper one at the point of contact. This is the case with most of the ribs of the left side, the furcula, the coracoid processes, and the thigh bones.

The hollow cup-like interstices of such of the vertebræ as still remain in contact, are lined with dog-tooth crystals of carbonate of lime; but wherever they are at all displaced, the interval is filled up by the surrounding substance, now converted into limestone; and this is the case even with the most minute cracks and fissures

in the bones, proving beyond a doubt that the bones were broken while the enveloping matter was in a soft state, and that the flesh or skin was in a great measure, if not entirely, removed. The compressing force that produced these numerous dislocations and fractures must have been considerable, and, supposing the animal's body to have lain on its back or right side, passed in a direction from right to left.

As the present state of our knowledge of the mode in which the Lias clays and limestones were formed, amounts to little more than conjecture, it is not possible to give a satisfactory account of the cause of the death of the Icthyosauri and other animals whose remains are found in such a remarkably perfect state in that stratum; but it is rather probable that, at Barrow at least, it may have been owing to sudden changes in the temperature and other conditions of the water, in consequence of volcanic action in the immediate vicinity of that part of the primeval ocean.

With regard to the nodular concretional form of the stone in which the petrifaction is imbedded, an explanation may perhaps be found by a reference to what has been observed to occur in the mixture of Silex and Alumina with some Oxide of Iron, that forms the potter's paste, which, when allowed to settle, begins to form into lumps by the attraction of aggregation that the particles of Silica have for each other. This circumstance has been applied to explain the formation of flints in chalk; and with the knowledge of the property that the mortar made from Lias lime has to harden under water, and of the tendency to form the same kind of concentric nodules round any organic nucleus, so striking in the ironstone beds of the coal measures, it need not be a matter of surprise that similar nodules are developed in the Lias where the same ingredients meet together.

The following analysis by Mr. Southall of this town, of the various substances found in the fossil, shows decidedly that the process of petrifaction has not entirely removed their animal matter. The matters analyzed were the bones, the black matter that lay between the ribs, and the white substance supposed to be coprolite. The bones contain 75 per cent. of matter soluble in diluted nitric acid, and the residuum, which resembles ivory-black, yields, when heated, an empyreumatic oil, and when a strong red heat is applied, the greater part is consumed. Mixed with oxymuriate of potash, the residuum deflagrates in the same manner as a mixture of oxymuriate and carbon. Ammonia added to a solution of the bones threw down a copious precipitate; and the nitrate of silver threw down

a flocculent precipitate from the same solution. The black matter contains about 22 per cent. of carbon, nearly 60 per cent. of carbonate of lime, and about 5 per cent. of other solid matter, which is composed of oxide of iron, some silex, and a trace of copper. The rest, viz., 13 per cent., appears to be water. The white matter contains phosphate of lime, or bone earth, and carbonate of lime, besides a dark substance left on the filter, which swells and burns like animal fibre when placed on hot iron.

AN INTELLECTUAL MONSTROSITY.

By J. L. Levison.

In designating any person an *intellectual monstrosity*, the terms would seem at first to be so contradictory, that I can fancy many of the orthodox *literati* would ask what I mean by them; and, previously to the explanation, suppose that we intend describing an individual with very decided talent, but who is deficient in worldly sense. Yet such is not altogether the kind of character I intend sketching: and, in order to make peace with readers of all kinds, I will candidly confess that I adopted the terms intellectual monstrosity, because they convey to my ideas the tangible representation of just what I wish to treat of, without being under the necessity of either a circumlocutory mode of expression or of useless and minute descriptions. Besides, the terms convey in a forcible manner the notions entertained upon the subject by the generality of mankind. Still, the object of the present article would be misunderstood, unless I give a more definite meaning, and explain that my definition is something different from its strict and literal sense. I intend, then, to express, by the words *intellectual monstrosity*, a being who is generally regarded as a moral phenomenon—one of those extraordinary personages who is looked upon with awe or derision by vulgar minds, and with admiration or envy by the more cultivated classes. In short, an eccentric compound of wisdom and simplicity, who, like many others, has received the title by common consent of being a genius! Yet our intellectual monstrosity is of a different species from the mad-cap erratic persons who shield themselves

under the above title; for it does not follow as a philosophical necessity, that he must do anything either injurious to others or annoying to himself. He may be harmless, kind, considerate; or energetic, irrascible, or dogmatic: but, whatever his temper, he is distinguished by one trait—he ventures to think for himself! 'Tis true, he may be indebted for his acknowledged mental superiority to an original and vigorous cerebral organization (as is the case of those persons who are called geniuses), or to his having concentrated his mental powers to one specific pursuit, which has enabled him to arrive at excellence in some art or science. It is very likely, however, that he may be less pleasing to a commonplace associate than if he had a superficial acquaintance with many subjects; but if we look to the advancement of science, then his value is incalculably greater. If such a person investigates any science, he gives up every thing that may distract his attention, and the whole of his thoughts are concentrated for the attainment of the object. He differs from the *dilletanti* in the sciences, as he does not allow any ulterior pursuit to interfere with his fixed purpose; hence he becomes the discoverer of new truths, or he is led to a clearer and more perspicuous view of those already known. And if *utility* is to be estimated, such a person is not only entitled to respect for his usefulness, but he merits esteem for his many privations and personal sacrifices. But it is a palpable truism, at which the heart sickens, that individuals who have been benefactors to their species, are, too often, victims of unmerited neglect, and very often, in days of yore, were punished instead of being rewarded. Even now, in our own boasted days of liberality, it is too often the case that men of talent suffer from poverty and unmerited neglect. Pensions are lavished on the *destroyers* of their species; but he who exercises his mental powers for the benefit of the common-wealth must be satisfied with the scantiest fare. It must be confessed, that if an intellectual monstrosity is needy, he is ill adapted to guide his vessel safely o'er the stormy seas of life; but, should his bark be wrecked, he is still less able to buffet the waves of adversity and disappointment, and his modest and noble spirit sinks in the unmerited struggle. If such a being should escape the ills of poverty or the insolence of the contumacious, it seems more than probable that he has a balance of happiness in his favour: for, if deprived of a well-earned reward for his various labours, he consoles himself for his many privations with the fond hope of posthumous fame! This one thought compensates for every present difficulty, and cheers him on the thorny road of existence, even though his feet are bleeding and his body is wearied

from excessive fatigue. Let sordid men sneer at what they term ill-judged notions—let them compare their own wealth with his indigence, and their substantial and present comforts with his ideal and dreamy anticipations—the sum total is not in their favour. The intellectual monstrosity has not any *tedium vitæ*, nor is his body the rendezvous of diseases; and if we compare the moments of pleasure by their endurance, the balance is in his favour; for never can things of a mere sensual nature be compared to the pure and hallowed emotions experienced from the exercise of our moral and intellectual attributes.

The object of this essay is not so much to point out the weaknesses of men of talent, but to deprecate the contumely with which they are often treated by the possessors of wealth. The man of refined intellect who is poor, is still rich in mental lore, and he not only derives pleasure from the continual acquisition he can make to his stores, which are, in one point of view at least, more secure than the riches which the worldling prizes: intellectual wealth is imperishable.

But much depends on the spirit which stimulates a philosopher. If he is feverish for the applause of his cotemporaries, and if he mistakes their occasional attention to him as respect for his talent, he will find himself miserably deceived. It often happens that when a man of genius is invited to the tables of the wealthy, instead of its being from motives of esteem it results from a most unworthy and selfish motive. He is expected, for such condescension, to repay his host with compound interest, by the delivery of an oral lecture on his most favourite subject; and all this because he has the *honour* of an invitation to dine: hence, he not only teaches the master of the feast, but instructs or *amuses* the whole party, who obtain in this manner much valuable information without any of that personal fatigue which even the most gifted minds must experience during the laborious period of study. What annoys us most is, that often the ephemeral patrons of talent mistake their own selfish motives and confound them with the hallowed sensations of Benevolence. If this noble sentiment really influenced their conduct, they would show it by a different bearing. We have often been disgusted at witnessing the tyranny and insolence with which an intellectual monstrosity has been treated on such occasions of mis-called hospitality. Whatever may have been his favourite pursuit, it is attacked on all sides; some part of the company affecting to admire it, whilst others express their doubts as to its relative or positive importance. The stranger being thus unpleasantly annoyed or ur-

gently importuned, is in the predicament of a sensitive and noble animal under the stings of a number of busy insects; for as soon as they discover his vulnerable parts, they contrive to suck him of all they want; and when their curiosity is satisfied, it is not an unfrequent occurrence that the talented being is left to unmerited neglect, particularly if some butterfly of fashion flutters about, decorated with an extrinsic garb of superiority. And this arises because the intellectual monstrosity has soared too high for their weak mental vision. They gazed for a short time, but could not continue to do so, as their heads felt confused and dizzy. But if good manners shield our monstrosity from such impertinence, he is sure to be forgotten, or, what amounts to the same, uncared for as soon as the company separates.

What is worthy of remark, is the fact that, when an intellectual monstrosity visits the tables of the great, it is not a matter of choice with himself as to whether he will *lecture* or not. He is expected to use his best endeavours, for his hospitable host assures him that "the party anticipate the pleasure of hearing him," &c. It is, however, of some importance, that the philosopher thus forcibly *exhibited* should have knowledge of human nature; for although he is expected to display his particular talent, yet should he be so deficient in worldly tactics as to begin to communicate his subject before any of the party have had their usual skirmishes, they become restless and inattentive, because it is obvious that "the curious creature" has been made acquainted with what would be expected from him, and they experience a kind of moral degradation, from a consciousness that they are acting improperly and unjustly to a man of worth. There is nothing so humiliating as being detected in some intentional act of insincerity: it is like the sudden exposure of heartless hypocrisy; and as in the one case the blush is no surety of any subsequent moral consistency, so in the other the self-reproof which those of a party may feel does not induce them to treat such a person with marked kindness and attention. The probability, however, is that the intellectual monstrosity will have roused their indignation at the assumed discovery of their using him as a convenience, or as a something to amuse them for a time from his *newness*—that they may, under the effects of their curdled passion, spurt poison on the innocent offender, and charge him with an over-weening vanity, or, with impotent anger, declare him to be deficient in that *elevated* intelligence which enables a possessor to communicate knowledge without making it appear anything like an obligation.

It also very often happens that an intellectual monstrosity is not gifted with a fluency of speech, which causes him at times to hesitate, and thus his communications may be inelegant and disorderly, but still intelligible. Some specimens of this species are extremely modest, and they shrink from the gaze of the mere curious—the lovers of wonderful sights, and have a great repugnance to receive applause, however they may feel assured that they have merited it. But individuals of a common cast of mind can ill appreciate such a nobility of sentiment. Vulgar persons, judging from their own thoughts, cannot believe it possible that any one can act from a refined benevolence—a species of high morality which delights in communicating to others, without reward, the information which labour may have enabled the philosopher to obtain on those subjects of *practical* rather than *speculative* advantage, and which are important from their usefulness. The true lover of his species would use some effort to benefit, not only the unfortunate, but also such persons as are the victims of the lower feelings, whether they rank with the class of the *uneducated* or the *ill-educated.*

Yet, in imparting mental wealth, there is as much delicacy required as in dispensing the money of our country to the needy: the manner should be, in both instances, kind and ingenuous. For, if pride and coarseness are substituted, more pain is inflicted and more humiliation endured than even greater gifts could compensate.

It also often occurs that an *intellectual monstrosity* is of so retiring a nature that it is painful to him to be shewn up as a *lion* in any company; and if he is importuned to give the usual *expected* oral lecture, his greatness of soul shrinks from an intercourse with persons so devoid of moral delicacy. He therefore sits silent, chagrined and uneasy, and reminds us of some humble but fragrant field-flower transported to a gaudy bed of tulips; it is more likely to stand the severity of the storm and the tempest than its more showy companions, who were useless when perfect, and without the redeeming fragrance which the less decorated one possessed.

Among the instances of rather an amusing kind, we may relate the following, as corroborative of some of the above statements. Mr. Stone was very fond of Natural History, and being an enthusiast, with a clear and easy mode of conveying his information to others, he was in the habit of receiving very frequent invitations. His love of talking was, however, quite a fault with him, and he indulged in it to excess. He knew that he had the honour of a card for the purpose of *lecturing* to the party, and therefore he engrossed

all conversation* himself. Although his auditors were satisfied that he was well acquainted with the subjects he spoke upon, they could not help feeling annoyed at his being too communicative. Hence, instead of leaving a party who had friendly feelings towards him, he provoked their criticism, and called forth unfair ridicule to detract from his actual merit. Had he been more judicious, and allowed others to talk as well as himself, even although he displayed less varied knowledge, he would not have pained their Self-esteem, and he would have won their nominal and conventional esteem. People feel insulted if any thing like an invidious comparison can be made. The poor man does not feel gratitude when he is shown the splendour and luxury of the lordly domain; nor do the superficial in mental acquirements entertain gratitude or respect when any one submits his intellectual stores in such profusion that their own poverty of ideas is thus unpleasantly forced into an unpalatable contrast. There are some persons, who may be regarded as exceptions, who, from an easy conversational manner, will frequently convey much information without making it seem any obligation. Mendelssohn says that such was the case with the author of *Nathan the Wise*, the illustrious Lessing.

I have been imperceptibly led to these lengthy remarks from a circumstance which occurred to me some years since. During a temporary residence in Norwich I was invited to a dinner party, to meet a great personage—a celebrated Chinese traveller—and great was my anticipation of the refined pleasure I should receive from his lecture or conversation (terms, under such circumstances, merely synonymous) on the manners and customs of the nations of the east. As soon as possible I hurried to the party, and quickly found myself in the drawing-room in a goodly company, and saw with mine own eyes the "lion of the day," and, what is more, the worthy master of the feast formally introduced us. The traveller rose in a dignified manner, and with a graceful bow he returned my respectful salutation; then he resumed his seat with much ease and propriety, and, bending his eyes on the carpet, gave himself up to his own cogitations.

Now I flattered myself on my physiognomical tact, and silently felicitated myself on a richer mental banquet than I had even anticipated. Dinner was at length announced, and a silent meal it was; it might have passed for a Chinese repast, and would have done ho-

* This might appear a genuine bull, but I mean that he asked questions and answered himself.

nour to the renowned taciturnity of the Bonzes. The cloth was removed in due time, and the general gravity was slightly relieved by a simultaneous smile on the appearance of the wine and dessert. Still silence continued; we sat in mute expectation, and at least one quarter of an hour had passed, and yet the stranger remained quiet! he had the rudeness not to give us a lecture "on the manners, customs, and language of the Chinese people!" We looked at each other and winked significantly to our host, who appeared somewhat disappointed. We knit our brows: some of us eat of various things, to vent the accumulated feeling of irritation; whilst others drank their wine quicker, and all looked angry at the traveller for his seeming indifference. In this way we were all under great excitement, and every one of us skirmished a little, partly to vent our spleen, and partly to induce the stranger to correct our apprehensions; but all hints were thrown away, as he continued to sip his weak wine and water, apparently perfectly unconscious of the perturbation he occasioned us. What annoyed us the more was the fact that he occasionally smiled most provokingly (no doubt at some of his own reminiscences); but we could not opine whether he did so at us, or at his own mental associations. There was not an individual present who did not consider his conduct as an open defiance of an established custom, an infringement of a conventional rule established by long usage. What was more, we had actually been invited to meet the celebrated Chinese traveller, who would, in all probability, amuse us with his numerous adventures. But in spite of all this he had disappointed us, and appeared only a commonplace kind of personage; and on our leaving we *unanimously* passed a sentence upon him "that he was a great bore!"

I subsequently discovered that this opinion was a very unjust one, and I now regard such conduct as was manifested by the party as a violation of true politeness and moral good breeding; for we consider it as the acme of insolence to expect or ask a stranger to lecture to a large party because he has been invited to a dinner! We were ourselves the real *bores*, by not paying attention and respect to a worthy and talented man for his own sake, instead of that unmollified selfishness which prompts an individual, with something like a feverish anxiety, to treat such a talented stranger as a mental monstrosity, who ought to be exhibited to the gaze of the curious. It was, however, a lesson of some importance to myself; for a few days after the above occurrence I had the privilege of dining with him at the house of the late talented and learned William Taylor, and it was indeed an interesting day—an epoch in my life! for we

unsolicited received information on the state of China, its literature, its arts, government, morals, &c.; and from that time I have felt a great veneration for an Intellectual Monstrosity, particularly when, like the traveller I have written of, he combines with great talent high and exalted moral perceptions.

Hall Gate, Doncaster,
October 19th, 1837.

OBSERVATIONS ON THE GEOLOGY AND MINING OF THE SOUTH STAFFORDSHIRE COAL-FIELD.*

THESE lectures were rather of a descriptive than a scientific character, as they contained many curious details respecting the mining and manufacturing operations, and the topography, of the district. The *first* was in great part devoted to a sketch of the facts observed by geological inquirers, and recorded as illustrative of the formation and progress of a coal basin. The probably heated and fluid condition of the earth at its first creation was assumed; and the gradual hardening of its surface, the movements of the crust, through the expansive force of gases and vapour, the disintegration of the elevated portions, and the deposition of their elements, under new combinations, by the agency of water, explained. Fire, therefore, might be termed the disturbing, water the tranquillizing power; and the action of both, proceeding through uncounted ages, alternately caused new elevations, and formed new compounds in the silent operation of deposition.

In the course of the long period of time thus occupied, the gradations of animal and vegetable life, suited to the progressive condition of the earth, were called into existence; and thus a study of the remains and of the preserved forms of organized matter presented, to a certain extent, an historical record of the relative ages of

* Being the substance of two lectures lately delivered at the Athenæum, in Worcester, by Mr. W. Hawkes Smith, of Birmingham. These lectures were attended by numerous audiences, who received them with marked satisfaction. Discourses of this kind are well-calculated to promote the spirit of generous emulation and inquiry.—ED.

different deposits; and these remains had received the appropriate designation of "medals of creation."

Similar was the process in a confined area like that under consideration. It must be conceived of as covered by the waters of a deep ocean, extending indefinitely on every side, and of which the floor of limestone and other inferior strata, was gradually covered with deposits of various rocky materials, carried down from distant and previous elevations. The accumulated strata, with the solid limestone on which they rested, were themselves elevated at certain points, till high ridges rose above the waters. The *debris* from these hills was, by continued aquatic operation, carried into the concavity or trough; and the hills themselves became, in due course, clothed with luxuriant vegetation, vast accumulations of the matter of which, in different stages of decomposition, were perpetually washed down, and took their place as definite deposits, which, buried under successive earthy layers, and subjected to the chemical and mechanical action of heat and pressure, took the form of that which we now call *coal*. Among other beds deposited in this trough or basin were also clayey sediments, charged with metallic particles, which, in process of time, took their present form of strata of iron ore, or, as it is commonly called, *ironstone*, which occur at different depths in the coal formation. The vegetable origin of coal was abundantly proved by the prevalence of carbonaceous matter in its depositions, and by the numerous remains which pervade every part of its mass; and the existing high temperature of the earth's crust was also inferable from the nature of the plants discovered, which were at once pronounced, by the botanist, to bear a distinct relation to those now known to belong to tropical climates. Thus, the once deep sea or lake was gradually filled up with sedimentary washings from high lands. But it was not in this evenly disposed form that the successive layers offered themselves to the miner. A series of movements, similar to those of the earthquake and the volcano, broke up the accumulated strata to an unknown depth; placed contiguous portions of the same deposits at the most discordant levels, and exhibiting the ocean beds of thick limestone, in highly inclined positions, as the principal constituents of abrupt and lofty eminences. That these movements took place after the deposition of all the characteristic strata had taken place, was clear, from the circumstance of the same measures being successively reached, in the same order, in places where they lay at extremely different distances from the surface.

The lecturer illustrated his subject by reference to several effec-

tive drawings, some of which were contrived, by means of moveable parts, to exhibit the gradual progress of the changes of which he spoke; one of the most striking of these was a map of part of South Staffordshire, which anticipated one of the suggestions of Mr. Wyse for facilitating the comprehension of geological topography. It exhibited at first a uniform colouring, expressive of the red sandstone with which the surface is covered; and several layers were successively removed from the part indicative of the coal field, coloured so as to give an idea of the coal, the rock measures, the iron-stone, the clays, &c., down to the prevalent bed of limestone; portions of the layers being cut out, in order to exhibit, in their proper situations, the coal, the basalt, and the lime, which are occasionally seen at the surface.

The *second* lecture was commenced by reference to a large and elaborately-constructed section, formed on careful observation and inquiry, and presenting a general idea of the condition of the strata through the coal field, could they have been examined immediately after the great elevations and depressions of their parts. A removal of a portion of the drawing exhibited afterwards to the eye, in a lively manner, the new line of surface, shewing the result of the gradual operation of air and water, in reducing the rough and precipitous ridges, filling up deep cavities, and producing the undulating line which now prevails.*

The relation of such a spectacle to the evenly deposited strata of a coal basin, in its original form, was pointed out, and the numerous interesting geological facts included within the range of the section adverted to; shewing instances of dislocations or "faults," by which the corresponding measures were thrown to a difference of level, amounting, in some instances, to a hundred yards; fissures or "dykes," filled up with injected veins of originally fused matter, now bearing the form of hard and closely-grained rock, interrupting the work of the miner, and occasionally bursting through the entire strata, and forming hilly protuberances on the surface; the elevations of the solid ribs of limestone into the *anticlinal* position, or sloping each way, at the Wren's Nest and Dudley Castle Hills, where these ocean beds are raised to angles of thirty, fifty, and eighty degrees; the coal measures, uniformly prevalent over the cavity of the basin, but broken and dispersed at the elevated ridges, dividing

* This magnified section was, in fact, with more of detail, generally similar to the one which is given by Mr. S. in his *Birmingham and its Vicinity*, and which will be found in our number for April, 1837, accompanying a notice of that work.—Ed.

and becoming of considerable magnitude towards the south-west, and cropping out and losing themselves on the north-east side.

The lecturer then proceeded to describe in succession, the valuable deposits and the mode of working them in different situations. Of the *limestone*, two beds, of twelve or fourteen yards thick appear to prevail beneath the coal formation It is of the period termed by Buckland *transition*, and abounds in the forms of Trilobites, Encrinites, and a variety of Crustacea and Zoophytes. It appears at the surface near Walsall; forms a range of considerable hills from Sedgely to Dudley, and is again seen at the Hayes, near Stourbridge. Its elevation and its excavated quarries afford many strikingly picturesque points of view, which were illustrated by large drawings; one of which, presenting the present aspect of the Wren's Nest, was adapted, by a removable piece, to exhibit a section of the hill, shewing the workings of the strata, their position, and the line of subterraneous canal constructed by the proprietor for facilitating the transit of the heavy material. The limestone is detached from its bed by the gunpowder blast, and is, in some situations, worked, like coal, by means of deep pits or shafts.

Above the lime, at a considerable distance, lie the *Coal Measures*, of which the following table gives the total thickness of the *getable* beds, or those which pay for working:—

	Y.	FT.	IN.
Brooch coal	1	0	9
Thick coal	10	0	0
Heathen coal	1	0	0
New mine	8	2	3
Yards	21	0	0

Of these, the most important is generally known by the descriptive title of "Ten Yard Coal." This is composed of numerous beds of varying qualities, separated by thin "partings" of sand or clay, and it is worked by the miner in five or six sections or stages, commencing with the lowest; large quantities, however, are left in the mine, as pillars for supporting the roof, and as heaps of unsaleable slack.

The thinner beds are more nearly cleared away; the superincumbent earth being supported by conical pillars, or "cogs," of refuse and waste. In all cases, a series of small passages for ventilation, called "air-heads," is carefully formed: these follow the en-

tire extension of the work, they are about three feet square, and various contrivances are adopted to promote the circulation of a stream of pure air through the cavities of the mine, both for the purpose of ventilation, and for the extrusion of the deleterious gases and vapours, which so frequently, in spite of all precautions, cause tremendous and destructive explosions. Another enemy of the miner is the *water* which is generally found in mines. This is carried by channels or passages, to a general reservoir, or "sump," from whence it is raised to the surface by a steam-engine.

The *ironstone* is found in beds of three to five feet thick; sometimes in the form of continuous strata or 'flats,' but most frequently as nodules of different sizes embedded in matrices, of coarse clay. It is entirely cleared; a plentiful supply of matter for supporting the roof being found in the stony and earthy refuse. In the mines both of coal and ironstone, the "gate-roads," or passages of access, are driven, *at first*, to the extremity of the proposed area, and the work then proceeds "homeward," thereby avoiding the difficulty and danger attendant on keeping open and continually re-entering the cleared parts.

Another mineral substance, of less value, but still of considerable importance, is the *Fire Clay*, which abounds in various situations, but is procured of the best quality in the neighbourhood of Stourbridge. Its superiority consists in its almost entire freedom from admixture with oxide of iron, and its consequent power of resisting extreme heat. This property renders it highly useful for the lining of smelting furnaces, and for crucibles and other vessels used in the making of glass, and in melting of metals for the founder. The mode of clearing out the clay is similar to that of the ironstone.

The iron-ore is an aqueous combination, in which the metallic particles are mixed with large quantities of argillaceous matter, and the science of the chemist is appealed to, in order to discover a substance which, uniting itself with the clay, should set free the metal. Such a substance, possessing the desired affinity, is the limestone, which is accordingly thrown into the furnaces with the coal and ironstone, when the metal runs off below, and the mixed matters form a species of imperfect glass, which is suffered to escape by passages contrived for the purpose.

The lecturer here introduced a detailed account of the operations of the iron-furnace, the forge, and the mill, to which, however, we can only thus allude. He then adverted to the remarkable features presented, in certain situations, by the pyrogenous rock already mentioned, which forms a line of hills commencing where the lime-

stone hills terminate, near Dudley. This is a species of *basaltic larva*, and takes various forms according to the mode in which it was cooled after ejection from its deep sources. The only purpose of utility to which it has been applied, is that of paving-stone; and having bsen usually procured from the quarries near the village of Rowley Regis, it has received the vernacular denomination of Rowley Rag. When met with in the form of dykes and veins, it is called by the miners "green rock." It is extremely hard, is slightly affected by the magnet, and consists of about five parts of silex, three of alumina, and two of oxide of iron. At Rowley, and Barrow-hills near Dudley, it occasionally exhibits the vertical columnar form; and at Pouck-hill, near Walsall, the columns are singularly well defined, but their position is nearly horizontal. The present state of the basaltic hills presents many picturesque groupings, of which the lecturer was able to point to some striking instances in large coloured views of scenery at Barrow and Pouck-hills.

In reference to the probable continuance of the supply of coal, he ventured to offer some calculations on the state of the mines; inferring from the immense quantities consumed—probably not less than the entire produce of an acre per week in the mining and iron works alone;—from the separated position and inconsiderable thickness of the "ten yard" measures in certain situations, and from the problematical result of the bold experiments now carrying on by Lord Dartmouth at Westbromwich, that the coal basin is in reality circumscribed, and its contents not so inexhaustible as some writers have deemed it to be, or as, from the present unrestricted, perhaps wasteful, consumption of an unrenewable store, would seem to be expected.

In conclusion, the attention of the auditors was briefly called to the reflections naturally suggested by the examination of such a page in the volume of Nature as had been opened in these lectures, and in which the observer could not fail to perceive that, by the operation of what are called laws of Nature and natural causes, several useful materials, closely allied in their adaptation to the service of man, have first been successively deposited within a prescribed area, and then removed and disturbed so as to render them accessible to human industry; thereby, as in every section of the works of Nature, exhibiting proofs of benificent intention, as well as design, intelligence, and power on the part of the creating mind.

SKETCHES OF EUROPEAN ORNITHOLOGY.

Gould's "Birds of Europe."

Parts XI. and XII.

Part XI.—This plate contains a good representation of a queer-looking bird, the Ural Surn, *Surnia Uralensis*—Hibou de l'Oural, *Fr.*—being a male, figured somewhat under the natural size. It is a very scarce bird, and one about which little is known. Mr. Gould believes that its general habits entitle it to a place in the genus *Surnia;* but an inspection of the plate before us, and especially the great development of the facial disk, makes us but ill satisfied with that arrangement. If it is to be a *Surnia,* assuredly it is a most aberrant species; but we cannot reconcile ourselves to classing it in that genus at all. Occurs, though sparingly, in the northern regions of Lapland, Siberia, Sweden, and Norway; is somewhat more plentiful in Hungary and Livonia, but is every where scarce, and is supposed to be confined to the Old World. Feeds on Leverets, Rats, Mice, Ptarmigan, &c. Builds in the holes of trees, and lays two white eggs. The sexes are similar, but the ground colour in young birds is lighter than in adults.

Little Plover, *Charadrius minor*—Petit Pluvier à-collier, *Fr.*—Kleiner Regenpfeifer, *G.* An adult and a young bird of the first autumn are very well figured. Science is indebted to Mr. H. Doubleday, of Epping, for the addition of this little species to the British fauna, a specimen having been taken at Shoreham, in Sussex. "From the extreme youth of the individual transmitted to us, it is clear that it must have been bred on the spot; and it is worthy of notice that the person who killed it affirms that he has long suspected the present bird to be a resident on that part of the coast," having noticed a peculiarity in the note of the species. It is abundant in the south of Germany as far as Italy, frequenting large rivers. Mr. Gould positively states that the American specimens he has examined are specifically different. Resembles the Ring Plover in habits, and constructs its nest among shingles on the water's edge; lays four or five yellowish-white eggs, blotched with black and brown. The sexes do not differ, but young birds want the black collar. This species is easily distinguished from the Ring Plover by its small size.

An adult, natural size and well-figured, of the Dalmatian Nut-

hatch, *Sitta rufescens*, Temm. Mr. Gould introduces to the public the Dalmatian Nuthatch as a new European species, being now for the first time figured. "The Dalmatian Nuthatch is an inhabitant not only of the country from which it takes its name, but also the whole of the south-eastern portion of Europe generally; indeed, to this section of the globe it appears to be strictly limited. In its general style of colouring, as well as in its form, habits, and manners, it exhibits a striking resemblance to the *Sitta Europæa*." Of its nidification nothing is ascertained. The magnitude of this bird, as our author justly observes, sufficiently distinguishes it from the rest of the genus. The sexes are similar.

Knot Tringa, *Tringa canutus*—Bécasseau canut, *Fr.*—Chiurlo, *It.*—Aschgraue Strandlaufer, *G.* Adults in summer and winter plumage are given; we do not admire the plate so much as many we have seen, but still we perceive no radical fault in it. Mr. Gould, on the authority of Cuvier, separates this species from *Tringa*, without, we think, sufficient grounds for so doing. The Knot Tringa is not resident in Britain, but abounds with us at certain seasons. Frequents the sea-shore or the fenny parts of the country, where it breeds. Common in the arctic regions of both worlds, ranging throughout the circle. In England the Knot is much sought after, by the epicures, for the table. The seasonal changes are remarkable, the whole of the reddish tint which adorns both upper and under parts of the summer attire giving place, in winter, to a plain ash-gray and white tint, whence the German appellation of *Aschgraue Strandlaufer*. The sexes differ little; but what is curious, and what was previously unknown to us, is that, according to Mr. Gould, "the *female* is the finest in colour and the largest in size."

Fantail Reedling, *Salicaria cisticola*, Gould—Becfin cisticole, *Fr.* Mr. Gould places this bird, provisionally, in the genus *Salicaria*, but we believe it will not long remain there. The design of the plate, representing the female in her nest among the tall herbage, on a stalk of which her mate is perched, is admirable. Inhabits the southern and eastern parts of Europe, and the adjoining portions of Asia and Africa. "It frequents low and swampy places covered with tall grasses, and," like the Marsh Reedling, "constructs a nest pre-eminently curious and beautiful, excelled by none of a similar character. Although incapable, from its small size, of entwining the larger reeds, it avails itself of the tall blades and stalks of grass, among which it places its nest; these it does not draw together" in the manner of the Marsh Reedling, "but by piercing each

blade, and drawing the whole together by means of cottony threads, secured at each perforation by a knot so ingeniously executed as to appear the work of reason.* Between the grasses thus secured it places the body of the nest, which is composed of vegetable fibres lined with a kind of flocculent down, collected from various plants." The eggs are four or five, and of a bluish flesh-colour. "When disturbed it takes long flights, chirping all the way with a remarkably loud and shrill note; and when in motion it erects the tail and spreads it in a circle, which appears very beautiful." The male only differs from the female in having the tail somewhat more elongated.

Ash-colored Harrier, *Circus cinereaceus*—Busard Montagu, *Fr.*—Falco rossiccia, *It.*—Halb Weyhe, *G.* Splendid representations, natural size, of the male and female. This bird is easily distinguished from the Hen Harrier by the superior length of its wings. Tolerably abundant throughout Europe, including Britain, but especially the southern districts. Feeds on small mammalia, Snakes, Frogs, Lizards, &c. Nidificates on the ground, among any kind of shelter suited to the purpose. Its flight is peculiarly buoyant and graceful. The female wants the ash colour of the other sex, and the young birds are of a more uniform plumage than adults. It is well known that the discovery of this bird as a distinct species is due to the zeal of our countryman, the late Colonel Montagu.

Hedge Alp, *Pyrrhula vulgaris*—Bouvreuil commun, *Fr.*—Rothbrustiger Gimpel, *G.* Mr. Gould figures the male and female, natural size. We really must, in this instance, withhold all commendation from the plate lying open before us. The Hedge Alp, or Bull Finch, is too familiar to need any description.

Stone Thicknee, *Œdicnemus crepitans*—Œdicnème criard, *Fr.*—Gran Piviere, *It.*—Graue Regenpfeifer, *G.* Of five or six known species of *Œdicnemus*, this is the only one that inhabits Europe. It arrives in Britain in spring, frequenting stony moors; it is found in similar localities in the south and east of Europe, and the adjacent portions of Asia and Africa. Makes no nest, but lays two eggs amongst loose stones; the young run as soon as they are hatched. Feeds on Slugs, Worms, Mice, reptiles, &c. The Thicknee runs very swiftly. The sexes are similar, and the young birds soon assume the adult plumage. The figure, of an adult, natural size, is excellent.

Egyptian Neophron, *Neophron percnopterus*—Catharte alimoche,

* But being in fact the work of *Constructiveness*.—Ed.

Fr.—Avoltojo aquilino, *It.* The representations, of an adult and a young bird, half the natural size, are exceedingly good. One individual has been met with in this country, in Somersetshire, and another bird was observed with it. But, as Mr. Gould justly observes, "the circumstance of this individual coming so far north, must be attributed entirely to accident, its native habitat being exclusively the southern provinces of Europe, and the adjoining districts of Asia and Africa. Like the rest of its family, it is one of Nature's scavengers, being ever on the search for carrion and putrid offal, upon which it greedily feeds, seldom, if ever, attacking living prey." Builds in the loftiest pinnacles of rocks; of the eggs nothing is known. The sexes are similar, the whole plumage, except the greater quill-feathers, being white. The young, on the contrary, which only attain the adult livery after various gradual changes, are almost entirely black.

Fork-tailed Petrel, *Thalassidroma Leachii*—Pétrel de Leach, *Fr.* The discovery of this bird in Europe is due to Mr. Bullock, who found it breeding in St. Kilda in 1818. It has since been found on various parts of the British coast. Its habits, food, and nidification, strictly resemble those of the Stormy Petrel. It differs, however, from the rest of the genus in being one of the largest, in having a forked tail, and remarkably short tarsi.

Stormy Petrel, *Thalassidroma pelagica*—Pétrel tempête, *Fr.*—Ungewilter Sturmvogel, *G.* A figure of the adult of this species and the preceding are given on the same plate, of the natural size. Both are excellent. This bird is "abundant over the whole of the northern seas of Europe, especially in the rocky islands of Scotland, where it breeds in the crevices of rocks, generally laying a single egg, of a pure white." It is a considerable time before the young are able to follow their parents.

Redpoll Linnet, *Linaria minor*—Grosbec sizerin, *Fr.*—Montanello minore, *It.*—Berg Zeisig, *G.* An adult male and female are represented, with a very happy effect. This bird is a native of the northern portions of Britain, and of all the higher latitudes of the continent; in autumn it migrates to the south of England and Europe generally. It is gregarious, being often found in company with Siskins and other Linnets. It subsists entirely on seeds, especially those of the Alder, Hazel, and Willow, resorting, in search of these, to low swampy grounds, and the borders of lakes and rivers. "The song, though not loud, is, nevertheless, simple and agreeable." The Redpoll breeds in abundance in Scotland and the north of Europe. The nest, which is neat and compact, is situated in any

of the above-named trees, or even in Furze. We have seen the nest in Derbyshire, and once, we believe—but are not certain—in Yorkshire. It consists of grass and moss intermingled with the down of the Willow-catkins; the eggs, four or five, are very small, and pale bluish-green, spotted with orange. The young of both sexes, the adult female, and the adult male in winter, want those beautiful red tints which render the full-grown male, in summer plumage, one of the most beautiful of the native *Fringillidæ*. These tints soon disappear, never to return, in confinement; "a circumstance," observes Mr. Gould, with great justice, "which should render us cautious in drawing any conclusions respecting the changes of plumage of birds from those that are kept in confinement."

Mealy Linnet, *Linaria canescens*, Gould. The London bird-catchers have no doubt as to the distinctness of this species and the preceding. They assert that it differs from the Redpoll Linnet in habits and haunts, and that in some winters it is extremely scarce, while in others hundreds are seen. "Whether this species is truly a native of Europe, or whether those which occur in our island are arrivals from the northern portions of the American continent, is a matter of doubt; true it is, that the specimens brought home by Dr. Richardson, which furnished the descriptions in the *Fauna Boreali-Americana*, are strictly identical with the bird before us." We believe it is now quite certain that the Mealy Redpoll is a distinct species. The figure, natural size, of an adult taken in the month of October, is beautifully executed.

The Hen Harrier, *Circus cyaneus*—Busard St. Martin, *Fr.*—Falco albanella, *It.* The plate contains remarkably fine representations, natural size, of the male and female. This bird has a wide range over Europe, India, and Africa, but the ill-directed zeal of our game-keepers has rendered it a very rare bird in Britain. It is light and buoyant on the wing, hovering at no great distance from the ground, and making but little noise in flight. Feeds on Mice, Leverets, Snakes, Lizards, Frogs, and young birds, darting on its prey with the most unerring precision. Frequents flat moor-lands, furze commons, and the vicinity of lakes and morasses, where it breeds. The nest is built on the ground, amongst any kind of herbage, and the eggs are of a dull unspotted white. The adult female, and the young of both sexes, are entirely destitute of the delicate grey hue of the adult male.

Marsh Bunting, *Emberiza palustris*, Savi. The male and female are figured, of the size of life: the former is very well executed. In plumage this bird bears a close resemblance to our well-

known Reed Bunting, but the beak, being considerably stronger, points it out as an aberrant member of the genus. Inhabits the marshes of Tuscany, and its habits are said to be similar to those of *E. schœniculus;* nidification unknown. The sexual and other changes of plumage are also the same as in the above-named species.

White-headed Undine, *Undina leucocephala,* Gould—Canard couronné, *Fr.*—Anatra d'iverno, *It.*—Weisskopfige Ente, *G.* We do not find the freedom of Nature in the plate before us, representing an adult male, size of life. We perfectly agree with Mr. Gould as to the propriety of instituting a new genus for the reception of this singular species, which could not even be included in *Hydrobates,* Tem. The White-headed Undine is abundant in, and almost confined to, the eastern countries of Europe, where it inhabits salt waters, and arms of the sea. So entirely aquatic are the habits of this species—whence the generic name, both Latin and English—that the nest is so constructed as to float on the water; and, although the facts are not ascertained by actual observation, the structure of the bird, as our author very properly observes, leaves no doubt but it is an expert diver, and that it swims with the body almost entirely submersed. Feeds on molluscs and insects. The female only differs from the male in having the general hue of the plumage of a duller tint.

Laughing Xeme, *Xema ridibundus*—Mouette rieuse, *Fr.*—Gabbiano moretta, *It.*—Lach Meve, *G.* It is a native of Holland, where it is always abundant, but is a bird of passage in France and Germany; also common in Britain. Frequents marshy islands in the neighbourhood of the sea coast and similar localities. Subsists on insects, mollusca, small fishes, &c., and resembles the Gulls in its habits. The nest is placed on the ground, on flat lands, and often at a considerable distance from the sea. The sexes are similar, and the winter plumage resembles that of summer, but young birds only attain the adult attire after the moult of the second autumn. The plate represents an adult and a young bird, natural size, and few of Mr. Gould's figures surpass these before us in truth and beauty.

On the next plate are given figures of the Coal Tit, *Parus ater*—Mésange charbonnière, *Fr.*—Cinciallegra minore, *It.*—Tanne Meise, *G.*; and Marsh Tit, *Parus palustris*—Mésange nonnette, *Fr.*—Cinciallegra cinerea, *It.*—Sumpf Meise, *G.* The latter much the best. These two species are widely distributed over Europe, and are abundant in Britain. The Coal Tit is distinguished by the

white patch at the back of the head. Both these birds possess a monotonous song, although the circumstance is not mentioned by Mr. Gould or any other ornithologist.

Common Ptarmigan, *Lagopus mutus*—Tétras ptarmigan, *Fr.*—Pernice Alpestre, *It.*—Hasenfüssige Waldhun, *G.* The figures, of adults in summer and winter plumage, though good, are not quite what we could have wished. It is well known to the majority of our readers that this bird becomes wholly white in winter, and of a mottled brown in summer, the plumage in the former case assimilating with the snow of its native mountains, in the latter with the moss and heath which it frequents. Abounds in the mountainous districts of central Europe, and is also found in the northern districts; likewise occurs in North America, and the mountainous parts of Scotland. It incubates early in spring, laying fifteen white eggs mottled all over with purplish brown. The young resemble the female. The male is somewhat larger than the female, and has the black streak on the cheek more intense.

White-winged Tern, *Sterna leucoptera*—Hirondelle-de-Mer leucoptère, *Fr.*—Sterna nera, *It.* A beautiful figure, natural size, of an adult. Confined to the south of Europe. "In habits, size, and structure, it strictly resembles the Black Tern; the pure whiteness of its tail, and the greyish white of its wing, will, however, serve at once to distinguish it from that species." Feeds on insects, worms, and small fishes. The sexes are similar, but young birds have less white on the wing.

Little Xeme, *Xema minutus*—Mouette pygmée, *Fr.* Two very good figures are supplied; representing an adult in winter attire, and a young bird, of the natural size. This little species is very rare in Britain, its true habitat being the east of Europe. Mr. Gould affirms that it never occurs in America. In summer the adults have the head black, and the young resemble the full-grown individuals in winter, but the red of the beak and legs is less intense. "Its flight is as light and buoyant as can well be imagined, and its general actions and form resemble those of the rest of the genus."

PART XII.—Common Nuthatch, *Sitta Europæa*—Sittelle torchepot, *Fr.*—Picchio grigio, *It.*—Kleiber, *G.* Mr. Gould's figures of a pair of these birds, natural size, are good, but rather too robust. Inhabits Europe, over which it has a wide range. In many of its habits the Nuthatch closely resembles the Woodpeckers, but it differs from them in being able to run up and down the stems of trees, during which process it may often be approached with ease. "The

position with the head downwards appears to be the most easy and natural. It not only assumes this attitude when alighting on the trunk or limb of a tree, but hammers at the bark or splits a nut in the same position. * * Insects, nuts, and various berries constitute their food. Their incubation is performed in the holes of decaying trees." The nest consists of dried leaves, and the eggs, seven in number, are greyish white with reddish spots. "The female is assiduous in her task, and defends her nest with her bill and wings, hissing at the same time in token of anger." In winter the Nuthatch frequents orchards and gardens in quest of food. The sexes, and also young birds, are similar.

Black-throated Diver, *Colymbus arcticus*—Plongeon lumme, *Fr.*—Polar Taucher, *G.* Fine representations of a male in full plumage, and a young bird of the year, three-fourths of the size of life. Extends throughout the arctic circle, frequenting inland waters and small lakes. This bird was first discovered to breed in Britain by our indefatigable countrymen, Sir W. Jardine and Mr. Selby, in the wilds of Sutherlandshire. Feeds on fish, crustacea, &c. The nest is placed close to the water ; the eggs, two in number, are dark olive-brown, blotched with black. "When the inland lakes of the northern climes become frozen, the adults retreat to the ocean, where they brave with impunity the coldest winters. Their power of diving is remarkable, not more for swiftness than for the long time they are capable of continuing submersed: it is this amazing power that enables them to avoid with the greatest ease every artifice of man to capture them on the open sea or large lakes." The sexes do not differ, but young birds are of a much plainer hue; they "undergo three moultings before they attain their full colouring."

Hooded Crow, *Corvus cornix*—Corneille mantelée, *Fr.*—Corbacchia mubachia, *It.*—Nebel Rabe, *G.* Common in all the mountainous portions of the continent, but especially Scandinavia. Abundant in many parts of England, and resident in Scotland. "It frequents the shores of the sea, the banks of large rivers, extensive downs, and such arable lands as are devoid of hedge-rows. It is seen in pairs, or three or four together. Feeds on almost every thing that comes in its way, including carrion, insects, &c. "Is abundantly dispersed along the banks of the Thames, and all such rivers as are under the influence of the tides. During the period of incubation they are said to be very destructive to the eggs and young of the Red Grouse, and will even attack lambs and Sheep. The eggs are four or five in number, of a greenish ground colour,

mottled with dark brown. The sexes are alike in plumage, and the young attain at an early age the colouring of their parents. The plate represents, in a beautiful and faithful manner, an adult male, natural size.

Dalmatian Kinglet, *Regulus modestus*, Gould. "A single specimen of this interesting little bird has been sent to us by the Baron de Feldegg, of Frankfort, to whom our acknowledgments are due, not only for this instance of his liberality in consigning to our care, at the risk of loss and injury, a bird probably unique in the collections of Europe, but for many similar instances of disinterested generosity.—The only history of this bird which we have been able to collect, was that written on the label attached to it by the gentleman above mentioned, and is as follows:—'I shot this bird, which on dissection proved to be a male, in Dalmatia, in the year 1829.' Its most conspicuous characters are the three yellow stripes which ornament the head; the brighter and most highly coloured of these marks, contrary to what obtains in any of the other *Reguli*, being that over each eye, while the coronal stripe is palest, and consists of feathers similar in length to those which cover the rest of the head." The same bird is, very judiciously, figured in two different attitudes, "to exhibit more clearly its characters and colouring." The lower figure is a perfect gem.

Common Coot, *Fulica atra*—Foulque macroule, *Fr.*—Schwarzes Wasserhuhn, *G.* The Coot is abundant in every part of Europe, but especially in Britain, Holland, France, and Germany, residing on large sheets of water abounding with Irises and other herbage. The nest is generally built just above the surface of the water, among the rushes, and is formed of the above-named and other plants. The eggs, from seven to ten in number, are of a chocolate colour, spotted with dark brown. The young take to the water almost immediately they are hatched; they are covered with black down, and have a red sealing-wax-like substance on the head. "When winter covers the ponds, lakes, and canals with ice, thus cutting off every needful supply, the Coot leaves its secluded quiet haunts of summer, and seeks the wide stream of the larger rivers, venturing even as far as their embouchures in the sea." This bird runs and dives with facility, but is rarely seen on wing. Feeds on Worms, Slugs, aquatic insects, seeds, &c.; we have also known it eat small fish. There is little or no difference of sex or season. We are very well pleased with the figure, of an adult, rather under the natural size. We think Mr. Gould might have managed to represent it of the size of life.

Bramble Finch, *Fringilla montana*——Grosbec d'Ardennes, *Fr.*—Fringillo montanino, *It.*—Berg Fink, *G.* The figures, of an adult male and female, are faithful portraitures. The Bramble Finch is abundant in all the elevated districts, being resident in some countries, migratory in others. In England it is not a common bird, and is only met with in winter. British specimens may, however, be seen in every collection, and we have met with several individuals in Yorkshire and the midland counties. "They appear to evince a decided preference to woods of Beech, on the mast of which they for a time subsist, feeding also on various seeds and the shoots of tender vegetables. Although it is very probable that a limited number remain to breed in the northern parts of this island, yet we have never been able to verify the fact. It is said to incubate in forests of lofty Pine and Spruce, the nest being composed of moss and wool, lined with feathers and hair. The eggs are white, spotted with yellowish brown, four or five in number." The colours of the female are less bright than those of the other sex, and the parts which in winter are brown in the male become black in summer.

Peewit Lapwing, *Vanellus cristatus*—Vanneau huppé, *Fr.*—Paoncella commune, *It.*—Gehaübte Kiebitz, *G.* Abundant throughout Europe, frequenting swampy places, wide moors, and stubble lands, and being at once distinguished by its peculiar cry and elegant and varied evolutions on the wing. Also occurs in India and Africa, but is restricted to the old world. We are a little surprised to find Mr. Gould characterizing the flight of this bird as "heavy, flapping, and apparently performed with considerable exertion." Surely the author cannot be speaking from personal observation.—Lays four eggs, olive colour and blotched with black, on the bare ground. Feeds on Worms, Slugs, and insects. The young birds, which are hatched early in spring, make a noise greatly resembling the well-known *peewit* of the adults. The male is brighter than the female, and his black throat changes in winter to white. The young attain the adult plumage in the second year. The figures, representing a male and female in summer and winter plumage, are rather too green, but otherwise good.

Citril Siskin, *Carduelis citrinella*—Grosbec venturon, *Fr.*—Citronen Fink, *G.* Very pretty figures of a pair of these elegant birds. Never seen in England, but common in the mountainous districts of southern Europe, building on the branches of the Larch and Fir. Lays four whitish eggs, with numerous brown blotches of various sizes. Feeds on the seeds of Alpine plants. It is reported to be a

fine songster. Its habits bear a considerable resemblance to those of the Green Siskin *(Carduelis spinus)*. "The female is rather less in size, and her colours are not so vivid as in the male."

Willow Ptarmigan, *Lagopus saliceti*—Tétras des saules, *Fr.*—Weisse Waldhuhn, *G.* Easily distinguished from the Common Ptarmigan by its superior size, and the rufous tinge of the summer plumage. The changes of plumage are as in the other species. The figures, of adults in different states of attire, size of life, are quite to our liking. Inhabits the north of Europe, becoming gradually less abundant towards the south, frequenting the mountainous districts. Feeds "during summer on the tender shoots and buds of Heath, together with berries of Alpine plants: in winter, when the face of the country is covered with snow, it burrows beneath the surface, and feeds on the scanty herbage, the buds of the dwarf Willow, and whatever vegetable food it can obtain." Builds on the ground, among tufts of herbage; the eggs, from six to ten in number, much resemble those of the Common Ptarmigan, but are, as might be anticipated, larger. The sexes resemble each other: the first plumage of the young is coloured, which at the autumn moult is exchanged for white."

Rock Swallow, *Hirundo rupestris*—Hirondelle de rocher, *Fr.*—Hirundo cauda-non-furcata, *It.* The representations, of a male and female, appear to be very good. Abundant in the south of Europe. It is larger than our Sand Swallow, which in plumage it much resembles. The tail of this bird, as the Italian synonym we have quoted attests, is not forked. It builds in the holes of rocks; the eggs, five or six, are white, with minute dots. Its food and general habits are similar to those of *H. riparia*. The sexes do not differ.

Pied Chat, *Saxicola leucomela*—Traquet leucomèle, *Fr.* Is abundant in the north of Europe, and although little is known of its habits, these are probably similar to those of its congeners. "Temminck informs us that so exclusively boreal is this species, that it is never seen in temperate climates; which leads us to infer that Siberia, Upper Tartary, and the most northern portions of Asia, will prove to be countries of which Nature has destined this bird to be a native." Those parts which are black in the male are brown in the female. A very fair figure of an adult male, natural size, is given.

Glossy Ibis, *Ibis falcinellus*—Ibis falcinelle, *Fr.*—Chiurlo, *It.*—Sichelschnabliger Nimmersat, *G.* This is the only Ibis occurring in Europe, where it inhabits the southern and temperate regions, but is very rarely found in England or Holland; is abundant along the course of the Nile, and in the adjacent provinces of Africa. Feeds,

like its congeners, on Worms, Slugs, Lizards, fresh-water mollusca, and aquatic vegetables. "The graceful proportions of this bird, the elegance of its actions, together with the resplendent lustre of its plumage, render it one of the most interesting of the Waders; and we regret that our knowledge of its habits and manners is so imperfect that of its nidification and eggs we can give no certain information." The sexes are similar; the young birds are dusky before the second or third year. A very fine figure of an adult male, three-fourths of the natural size, is given.

Lesser Woodpecker, *Picus minor*—épichette, *Fr.*—Picchio minore, *It.*—Kleinste Specht, *G.* Pretty figures, natural size, of an adult male and female. This bird, as our author justly observes, is the smallest of the European species, but is superior in size to some found in other portions of the globe. The appellations *lesser, minor, minore,* and *kleinste* (least), are, therefore, erroneous, though it would scarcely be worth while to alter the name. Is confined to Europe, over the whole of which it extends, being found in parks, woods, and orchards, where it climbs the trunks and branches of trees with great agility. Mr. Gould says it is much commoner in England, especially the south, than is generally supposed. In spring it utters an oft-repeated single note, resembling that of the Wryneck. Lays, in the holes of trees, four or five pure white eggs. The crown of the head, which is scarlet in the male, is white in the females. Young birds resemble the adults.

Tufted Pochard, *Fuligula cristata*—Canard morillon, *Fr.*—Anatra col-ciuffo, *It.*—Rheier Ente, *G.* The plate represents a pair of these birds, rather less than the natural size. Mr. Gould is peculiarly successful in his illustrations of water birds, more especially the *Anatidæ,* and the plate before us yields to none we have seen in truth and beauty. The Tufted Pochard is a regular winter visitor in Britain, distributing itself over our lakes, arms of the sea, &c., being mostly seen in pairs, "repeatedly diving in search of food, which is obtained exclusively at the bottom of the water, and consists, for the most part, of various fresh-water shell-fish, crustacea, Worms, and mollusca; to this food it occasionally adds vegetables. On the approach of spring it retires northward to breed, and makes the morasses and the unfrequented regions of the arctic circle an asylum in which to rear its young. The range of its migrations southward is very considerable. The Tufted Duck is brought to the London market in considerable numbers during the winter." The colours of the female are more dusky than those of the male; the young have no tuft on the head.

Alpine Chough, *Fregilus pyrrhocorax*. The plate contains a very spirited representation of an adult, natural size. In general appearance this species bears a remarkable resemblance to the Garden Ouzel (*Merula vulgaris*). Inhabits the precipitous elevations of the Alpine districts of Central Europe. "During summer it seldom descends far below the line of perpetual snow, but in severe winters it is sometimes driven to the lower mountain ranges, more, perhaps, in order to obtain food, than to avoid the severity of the cold. Berries, grains, insects, Worms, &c., constitute its food; it is, indeed, almost omnivorous." Builds in fissures of rocks or holes in old walls; the eggs, from three to five, are dull white, blotched with yellowish-brown. The sexes are similar, but the black is less pure in young birds, and the bill, orange in adults, is blackish.

White-fronted Goose, *Anser albifrons*—Oie à-front-blanc, *Fr.*—Oca Lombardella, *It.*—Blassen Gans, *G.* The figures, of an adult and a young bird of the year, are faultless. This bird passes the summer in the northern latitudes of both worlds, where it also breeds; migrates southwards in autumn, great numbers passing into Holland, Germany, and France. Not uncommon in England, especially the midland and southern counties, frequenting low fenny districts. Feeds on aquatic vegetables, Snails, &c. Its flesh is said to be finely-flavoured and tender. Mr. Gould is not aware whether the black markings on the breast are only assumed during summer, or whether they are confined to certain individuals. We think it probable that they are never found in young birds.

White Pelican, *Pelecanus onocrotalus*—Pélican blanc, *Fr.*—Pelicano onocrotalo, *It.*—Grosser Pelekan, *G.* An adult male is well-figured, one-third of the natural size. "Strictly confined to the old world, over a great portion of which it is plentifully distributed." Temminck states that the bird found in Europe and South Africa is the present species. Feeds on fish, which it catches with extreme agility, notwithstanding the cumbrous appearance of its bill. It is unable to dive, and therefore frequents shallow water. Builds on the ground, constructing the nest, about a foot and a half in diameter, of coarse herbage, lined with soft grass; lays two or more white eggs. The pouch under the bill can be contracted or extended at pleasure. The first year's plumage is wholly brown, the complete adult attire—white, with rosy tints—not being acquired till the fifth or sixth year, from which we infer that the bird is long-lived.

Razorbill Auk, *Alca torda*—Pingouin macroptère, *Fr.*—Tord Alk, *G.* An adult and a young bird are figured, of the size of life.

The plate is remarkably pleasing. "Generally distributed throughout the seas of the arctic circle, never extending its migrations beyond the temperate latitudes of Europe in the old world, and the southern portions of the United States in the new. Inhabits the wide expanse of the ocean, the severities of which it braves with indifference; indeed, it appears to rejoice in the agitation of the billows, that bring around it multitudes of small fish, which constitute its only support." Lays a single egg on the barren ledges of rocks. In winter adults lose the dusky colour on the throat, aud the old and young birds, at that season, closely resemble each other. The sexes offer no external difference.

Little Nightling, *Noctua nudipes*, Gould—Chouette chevêche, *Fr.*—Civetta gialla, *It.*—Kleiner Kauz, *G.* This bird is not the *Strix passerina* of Linnæus, although modern authors have termed it *Noctua passerina*, and therefore we are glad to find Mr. Gould has restored Nilsson's designation, *nudipes*. The plate represents an adult, natural size, very well. Abundant over nearly the whole of temperate Europe, but only a straggler with us. Preys, in the evening, on Mice, Moles, small birds, and large insects. The eggs, four or five, are deposited sometimes in trees, but more commonly in old walls and ruined towers. The sexes and young are similar.

Bernacle Goose, *Anser leucopsis*—Oie bernache, *Fr.*—Weisswangige Gans, *G.* Common in Holland, France, and Germany, and, in winter, on the whole of the western coast of Britain and the north of Ireland, frequenting marshy localities. Feeds on vegetables, seeds, and grain. "Breeds in the regions of the arctic circle, but we have no correct information as to its eggs or its peculiar habits of nidification, in which, however, we conceive it agrees with its congeners." The sexes are similar, but young birds have the face more clouded with black. Mr. Gould's figure of an adult, three-fourths of the size of life, is as good as we could desire.

TWO CHAPTERS, ILLUSTRATIVE OF THE CHARACTER AND CONDUCT OF JAMES I.

"It is scarce hyperbolical to say, that this prince has been the original cause of a series of misfortunes to this nation, as deplorable as a lasting infection in our air, our water, or our earth would have been."—BOLINGBROKE'S *Dissert. upon Parties.*

"Maximus in folio, minimus in solio."

"The reading of histories may dispose a man to satire; but the science of history studied in the light of philosophy, as the great drama of an ever unfolding Providence, has a very different effect."—COLERIDGE, *On the Church and State.*

On a fly-leaf in the octavo edition of Bevil Higgons's works, deposited in the British Museum, a late distinguished president of the Royal Society, Sir Joseph Banks, has thus expressed himself:—"In contemplating his character, which seems eccentric, his style is, in my opinion, though unequal, the most distinct and easy to comprehend in his best passages that I recollect ever to have met with."* That this author should have been so praised by any moderately competent appreciator of a felicitous selection of expressions—by any one who pretends to have paid the least critical attention to those qualities of style which put the reader at once into possession of the whole sense, is to us as startling a thing as if we had found a defence of popery among the writings of John Knox, or from the pen of John Wesley a eulogy of calvinism: for he who will be at the trouble of comparing a few pages of Higgons with our writers admired for perspicuity of style, must presently discover that a most undeserved compliment has been paid to him, since "he draweth out the thread of his verbosity finer than the staple of his argument." At first sight, it would seem to be a paradox that the fame of Higgons should stand so high among our foreign literati, that translations, we are told, of his *Historical and Critical Remarks on Bishop Burnet's*† *"History of his own*

* This note is addressed to Sir William Musgrave.

† Of this fierce opponent of the bishop, who so perseveringly flourishes his metaphorical sword the pen against him, we know but little, and that little is not calculated to excite the reader's respect. In the *Biographie Universelle,*

Time" have lately appeared in German and Italian. But "we would entertain the conjecture" that this never would have happened, if Higgons had not been the devoted champion of those political vitalities which are still warmly fostered in the bosom of many an absolutist on the continent, "with whom the original taint transmitted down from King James the First remains still in the full strength of its malignity."*

To be duly qualified for his censorian task, Higgons should have been possessed of a great fund of historical knowledge, conjoined with a discriminating judgment. In both these requisites he is strikingly deficient. There may be shrewdness in some of his observations, and the truth of the inference he has drawn from some insulated facts is, perhaps, not to be questioned. Yet no impartial man can look into his pages without perceiving that, under the semblance of truth, he is an artful bigotted partizan, and one who acts the sophist rather than the fair enquirer; so that a person would no more be able, by perusing his volume, to form a correct estimate of the *History of his own Time*, than he would of the meridian splendour of the sun by seeing it under an eclipse. We reiterate our opinion, then, that his strictures would have been consigned to the land of forgetfulness, if he had not been more eager to excite or aid the ambition of despotic power, than to damp and discourage it. And because, in Burnett's account of James, there is not that blindness to the manifestation of truth and duty which would entirely overlook his most palpable acts of mis-government—his most glaring iniquities and errors—the bishop is arraigned by Higgons in a strain of vituperation suited only to the abettors or zealots of the grossest corruption. An impartial recital of facts thus assumes in the eyes of this most malignant of traducers the aspect of an invective. We shall, however, bring a supplementary set of them to show—and facts, according to the proverb, "are stubborn things"—that Burnett had no desire to throw a cloud of detraction over the imputed merits of James, but was more inclined

par une Société de gens de lettres à Paris, chèz Micaud, 1817, we are informed that Higgons was born at Kelso in 1670, and early distinguished himself for his attachment to James II., whom he accompanied to Paris, and remained with him till his death in 1701. After this he returned to England, and to propitiate the government of William, he published "*The Generous Conqueror.*" This political trimmer then became Professor of History at one of our Universities, and gave to the public, beside this tirade upon the History of his own Times, an abridgment of the *History of England.*

* See Bolingbroke's *Dissertation upon Parties*, vol. iii., p. 132.

to give his misdeeds a modified form, than to mark them with an honest and undaunted reprobation.

Now some writers, regarding the reign of James as one of the most disgraceful epochs in the English annals, have, with the best intentions, though certainly not with the best judgment, rapidly glanced over it, thinking that its transactions might be wisely sent to oblivion. But it has been well observed by Von Raumer that "the attractive period of the Rebellion is as little to be understood without an accurate knowledge of the history of James, as the French Revolution without a knowledge of the history of Louis XV."* Unquestionably the British king, with all his affected political sagacity, was not a "discerner of the signs of the times." He knew not that each age developes principles, the conception of which has been the work of a preceding age; and therefore he imagined not that by saying, and acting upon the conviction, that the prerogatives of the crown were an indefinite trust, and not held for the benefit of the governed, he was laying a mine whose explosion would rend into pieces the throne of his successor. What composed investigator of that forcible shock or movement the *Great Rebellion*, does not perceive that the fiery excesses of popular passions thereby called forth, are as much derivable from James's want of inferring, from an expansion of intellect among the ascendent classes of the community, a proportionate advancement in the love of civil and religious freedom, as from his actual faithlessness and misrule. A reign, therefore, so especially remarkable, by leading to those great struggles and changes which ended in the abolition of the regal name and power, and the prostration of the episcopate, inglorious as it may be in itself, must ever hold a prominent place in the philosophy of history.

We assert, then, without any qualification or restriction, that the national troubles of the seventeenth century are clearly traceable to certain speculative notions of James, upon unlimited regal power and upon the doctrine of passive obedience, which, however they might exist in books,† could never be brought into practical working without the fatal assumption of "the right divine to govern wrong." Surely his open and distinct declaration to

* See *History of the Sixteenth and Seventeenth Centuries*, illustrated by original documents, vol. ii. p. 191.

† In Cowell's singular work, entitled the *Interpreter of Words and Forms in Common and Statute Laws*, Lond. 1701. fol. we find descriptions of an English king which faithfully represent the feelings and doctrines of James on this particular point.

Beaumont, the French ambassador, that his master and he were "absolute monarchs, and in no respect dependent on the counsels or consent of their people,"* must have early led those who possessed elevated and energetic sentiments to ponder upon the conflicting duties of subjects and free men; while, from his entering upon his high office with these fundamental principles upon the prerogative royal, "from his mistaking the weight for the strength of the sceptre," it is no wonder that, in a subsequent despatch, Beaumont should have expressed this deliberate and sagacious opinion upon the royal infatuation:—"I recognize so many seeds of unsoundness in England, so much is brewing in silence, and so many events appear to be inevitable, as to induce me to maintain that, for an hundred years to come, this kingdom will hardly misuse its prosperity to any other purpose than its own injury." But still, as so much scepticism† prevails, even in the present day, respecting the real character and conduct of James, we purpose here a lengthened discussion, the main object of which is, however, not controversy, but instruction.

One of Higgons's first furious diatribes is directed against Burnett, for presuming to say that James sent the pope a letter of reconciliation. There is plausibility enough in his endeavours to establish the point that the bishop has intentionally falsified history in advancing this charge; but, luckily, available materials exist completely to vindicate the accuracy of our historian on the subject. Higgons's strictures are given in his most characteristic manner. He thus commences them:—"Not content to injure private persons, he judges with the same rashness of princes; he first charges positively king James with writing a letter to the pope, and then comes off with a general belief of that matter."‡

Now it is a fact as notorious as any in our history, that James, with a view to secure his accession to the English throne, earnestly sought to engage in his interests those foreign powers who were most attached to the Romish see; and for the furtherance of that

* See Von Raumer's *History of the XVI. and XVII. Cent.* p. 197—199.

† "In the course of study, and with a more enlarged comprehension of the age," says Mr. D'Israeli, "I was frequently struck by the contrast of his real with his apparent character, and I thought I had developed those hidden and involved causes which have so long influenced modern writers in ridiculing and vilifying this monarch." See an Enquiry into the literary and political character of James I. by the Author of the *Curiosities of Literature*, p. 7. London, 1816.

‡ *Remarks on Bishop Burnett*, p. 11.

object a letter, with his signature, had been sent to Clement VIII. Elizabeth had obtained some insight into this affair, but was deceived into a belief of her successor's innocence by his steadfast denials. Peculiarly circumstanced as James was, his motives for conciliating not only the pontiff, but the chief princes of Europe,* cannot but be obvious to the shallowest politician. If we are to place confidence in the letters of Cardinal d'Ossat, there was a settled plan formed by the popish princes, and which had the sanction of the pope, to exclude a heretic from the throne of England. The hostile spirit manifested by Henry the Fourth towards the succession of James, which arose from the belief that the union of the two crowns would advance England, in power and influence, above the chief continental states,† is well known. James also was apprized that cabals had been formed in support of the titles of the Lady Arabella Stuart‡ and the Earl of Hertford; nor was he unapprized of the intrigues carrying on in favour of the Infanta,‖ the daughter of Philip II., who had given broad hints that, if the English would co-operate with him in wresting the sceptre from Elizabeth's hands, a free parliament should elect any Roman Catholic sovereign, not doubting that its choice, under such circumstances, would fall upon the Infanta, especially as he had also thrown out to the merchants the tempting lure of a free trade to the Indies.§ This affair, perhaps, would not have so much alarmed James, had he not been well

* See his instructions to his ambassadors in *Birch's Memoirs*, vol. ii., p. 510—514. Miss Aikin observes, "There was not a petty protestant prince allied to him by his marriage, to whom he did not deem it requisite to direct a solemn embassy for the purpose of explaining his right." See her very able work, *Memoirs of the Court of King James I.*, vol. i., p. 38.

† See Winwood's *Memorials of Affairs of State*, vol. i., p. 352.

‡ Mr. Townshend in his *Accusations of History against the Church of Rome*, is mistaken when he asserts that Arabella was a Romanist; predisposed no doubt she was to that party, but had never professed the Roman Catholic Religion. So late as 1610, she incurred "some suspicion of being collapsed." —*Winwood's Mem.*, vol. ii., p. 117.

‖ The writings of Father Persons or Parsons the Jesuit, prove him a man of great talents, but his principles were detestible; for they sought to infuse a distrust of all power which did not lead to the establishment of the most complete Papal Despotism. In his celebrated work, entitled *Doleman's Conference on the next succession to the Crown of England*, he advocates most powerfully the claims of the Infanta, deriving her descent from John of Gaunt, and thus making her the right heir of Lancaster. Many a learned genealogist will admit that several of his proofs, premises and conclusions are founded upon weighty and sufficient reasons.

§ For this fact, see Birch's *Memoirs*, vol. ii., p. 308.

aware that he reigned over a people, at that time, hated by the English; and therefore, however averse they might be to the dominion of strangers, yet it was possible the national prepossession would run strongly against his pretensions. Another serious cause of apprehension was, that the will of Henry VIII., which had been ratified by act of parliament, seemed to exclude the Scottish line. For, after entailing the crown upon his own children, he settled it, in default of their issue, upon Frances Brandon, Marchioness of Dorset, and Eleanor, Countess of Cumberland, daughters of his younger sister, Mary. In failure of their posterity, it was to go to the next lawful heir, under which words must be implied the reigning family of Scotland, descended from Margaret, wife of James V., and eldest sister of Henry. As the descendants of Mary were living at the decease of Elizabeth, political asperities, personal animosities, and local dissensions, might have operated powerfully to prevent the scion of the house of Stuart from obtaining the sovereignty of England, had not sound policy determined that concord between the two kingdoms, and their ultimate consolidation, were most likely to be secured by the elevation of James to the British throne.* It is not wonderful, then, that, to countermine the machinations of Philip and his other Roman Catholic opponents, James

* Higgons's unqualified invective here against Burnett is not likely to have much weight with critics of sounder judgment and more candid dispositions, when they are reminded that the Bishop in his *History of the Reformation*, with a view to support the lawful claims of the House of Stuart, seems favourable in a high degree to the opinions of Secretary Lethington, the Bishop of Ross, and Sir James Craig, who deny the genuineness and authority of Henry's will. Assuming their reasoning to be correct on this point, still it is quite clear that James ascended the throne of England in direct contradiction to the order of succession appointed by several Acts of Parliament. In the Act, however, which recognised him, it is expressly said, such was then the servile state of feeling towards him on the part of the popular branch of the legislature, that "immediately on the dissolution and decease of Elizabeth, late Queen of England, the imperial crown of England did, by inherent birth-right and lawful and undoubted succession descend and come to the said King James." This bill for his recognition was read three times on the same day in the House of Commons. See the Journal of that House 1st Jacobi. His Majesty must have been highly flattered by this unprecedented compliment. It is not generally known, that for nearly twelve months after James's accession, the statutes then in force vested the legal right to the throne in Lord Seymour, eldest son of the Earl of Hereford, by Lady Catherine Grey (sister of Lady Jane Grey), as heir of Mary, Duchess of Suffolk, the youngest sister of Henry the Eighth.—For this curious fact, see Sir Harris Nicholas's *Literary Remains of Lady Jane Grey*, p. cxxvi—cxlviii., note.

should have secretly entered into a political union with the pope; for though there was religious intolerance on both sides, yet that was not allowed to present a fatal obstacle to a good understanding between them, when they found their interests, in so many important respects, to be the same.

The following statement, however, of Burnett, has exposed him to a storm of invective from his reviewer:—"A letter* was also written to the pope, by him, giving assurance of this, which, when it came to be published, by Bellarmine, upon the prosecution of the recusants, after the discovery of the Gunpowder Plot, Balmerinock did affirm that he, out of zeal to the king's service, got his hand to it, having put it into a bundle of papers that were signed in course, without the king's knowing any thing of it. Yet when that discovery drew no other severity but the turning him out of office, and the passing a sentence condemning him to die for it, which was presently pardoned (and he was, after a short confinement, restored to his liberty), all men believed that the pretended confession of the secretary was only collusion to lay the jealousy of the king's favouring popery, which still hung on him, notwithstanding his writing on the Revelations,† and his affecting to enter, on all occasions, into controversy, asserting in his book that the pope was antichrist.‡ An evil concupiscence of theological controversy will ultimately involve the peace and respectability of the individual who indulges in it. If James, in one of his polemical treatises, had not said what

* *History of his own Time*, vol. i., p. 14. Oxford Edition.

† In reference to this composition, Boderie the French Ambassador says, that it was "le plus fou, s'il m'est loisible d'ainsi parler, et le plus pernicieux que se soit jamais fait sur tel suject."—t. iv. p. 302. Scaliger remarks, that Calvin was wise, because he did not write upon the Revelation. "Calvinus sapuit, quia non scripsit in Apocalypsin." But it was the spirit of James to deem himself wiser than all the world besides, and therefore he so often made himself the laughing-stock of Europe. "La presumption seule," says Boderie, "qu'il à de sçavoir plus en théologie que tous les docteurs du monde, en est l'unique cause." Ibid iv. p. 319. A young Prince, for James had not then attained his twentieth year, writing a Latin commentary on the Apocalypse, was an undertaking so preposterously strange and even ludicrous, that we might almost anticipate the reply of his illustrious tutor Buchanan when reproached for making his Sovereign a *pedant*—"that it was the best he could make of him."

‡ In his eager desire to purify the theology of Rome, lest his own should be brought under a suspicion of orthodoxy, he thought it proper to soften down his interpretation by saying, that the Pope was Antichrist only while he clothed himself with temporal authority in other states, besides his own.

offended that formidable champion of the Roman Catholic cause, Bellarmine, his letter to the pope would, in all probability, have been forgotten; but, under the name of Matthæus Tortus, the exasperated cardinal published it, and, further to annoy his royal antagonist, accused him of abandoning the good policy of toleration which he had professed to Clement VIII., and of disappointing the hopes which he had held out of speedily relinquishing the protestant religion. Sir Ralph Winwood positively asserts that, in the year 1596, James despatched a Scottish baron of the name of Ogilvie to Spain, to assure his catholic majesty he was then ready to turn papist, and to propose an alliance with that king and the pope against the queen of England; but, for reasons of state, the affair, he adds, was hushed up.* Elizabeth must have found it difficult to stifle her suspicions of his vacillating spirit in his religious creed, when she enjoins Sir Richard Wigmore, among other topics of instruction, to "induce the king resolutely to profess himself a protestant,† and to relie and depend upon the amitie of Queen Elizabeth and England, rather than that of any other potentate."

To make a safe passage through the perils of this direct and unexpected attack—to get rid of the high moral and political misdemeanour of a protestant monarch carrying on a correspondence with him, who was then deemed the very personification of the Antichrist, the Man of Sin—and in that correspondence not only soliciting the dignity of cardinal for a Scottish papist, Drummond, Bishop of Vaison, but even subscribing himself "Beatitudinis vestræ obsequentissimus filius,‡ J. R."—the king had no alternative but that of throwing the odium of the letter upon his secretary, Elphinston,

* See Winwood, vol. iii., p. 55, 56.

† "It appears," says Burnett, "that Walsingham thought that the king was either inclined to turn Papist, or to be of no religion." *Hist. of his own Time*, vol. i. p. 13.

‡ See Rushworth's *Hist. Collec.* vol. 1, p. 166. And yet we have him afterwards parading forth his consistency of religious belief to Buckingham, who had no religion at all, telling him, "I am not a Monsieur who can shift his religion as easily as he can shift his shirt when he cometh from Tennis." See Hardwick's *State Papers*, vol. i., p. 412. To the same effect did his son afterwards express himself. And yet he too wrote a letter to the Pope, which so scandalized the protestantism of Clarendon, that he openly hints his feelings of dissatisfaction at it to his confidential friend, Secretary Nicholas. "The letter to the Pope is by your favour more than complimentary, and may be a warning that nothing is to be said or done in that nice argument but what will bear the light." See Clarendon's *State Papers*, vol. ii., p. 337.

afterwards created Lord Balmerino, who confessed, *as it is said*, that James affixed his name to this paper, among other official instruments, without any knowledge of its contents. If we enquire a little further into the history of this curious transaction, it will appear evident to those who like to have things reported just as they are,* that James had acted towards Balmerino as Elizabeth did towards her under secretary, Davison, respecting the despatch of the warrant for the execution of Queen Mary.† Now, Clement's former assurances to James, that, as the son of his virtuous mother, he had prayed for his temporal and eternal welfare, and his ordering public thanksgivings and processions at Rome to celebrate his accession, are circumstances which assuredly will not be thought to form exceptions to the tenor of the above remarks, since they must produce a strong impression of James's early leaning to popery, independently of the grand fact that his very first speech in parliament, according to a remark of that keen observer, Professor Heeren, "declares in such plain words that catholicism (excepting the doctrine of the papal supremacy, which was detestable to him from its limiting the regal power), was the religion of his heart, that it could not but destroy once and for ever the confidence of the nation in their king.‡"

There would seem no room for doubt, in the judgment of Sir John Scott, that Balmerino was the person selected to rescue the king from his hapless predicament: for this writer roundly asserts the entire knowledge and direction of James in this affair. "Balmerino," says he, "was in such favour with King James, that he craved the reversion of Secretary Cecil's place at the king's coming to the crown of England, which was the beginning of his overthrow; for the said Secretary Cecil wrought so, that he procured a letter which had come from King James, wherein he promised all kindness to the Roman see and pope if his holiness would assist him to attain to the crown of England. This letter the said Secretary Cecil shewed in the king's presence in the council of England; whereupon King James, fearing to displease the English nation, behoved to disclaim the penning of this letter, and lay the blame thereof on his secretary, whom, a little before that, he had made Lord Balmerino, to whom he wrote to come to

* See Caldewood's printed *History*, 426, 427, 604. Howell's *State Trials*, and *Ambassade de M. de la Boderie*, t. iv., p. 66.

† For her treachery and hypocrisy in this whole affair see *Life of Davison*, by Sir Nicholas Nicolas, p. 14, and art. Davison, *Biog. Brit.*

‡ See *Historical Treatises*, from the German of A. H. L. Heeren, p. 232.

court, where being come, for exoneration of the king, he behoved to take upon him the guilt of writing that letter.* It is also asserted by Balfour, that he (Balmerino), confessed simultatly, as was thought by thesse, that he wnderstood the courte, and how matters then went, to liberat the king of such grossness."† Let us now hear the declaration of the ill-treated secretary himself:—"Next followed my conviction in St. Andrew's, wherein I was the only actor myself, to give his majesty satisfaction, following in every point the Earl of Dunbar's direction, brought to me by my Lord Burley or the Lord Scone."‡ If suspicions still remain that James was a stranger to this letter, these additional remarks may be thrown out, to put an end to every doubt:—That Lord Home, who was himself a papist,|| had been entrusted with a secret commission to the pope; that the king, in his reply to the cardinal, as carefully avoids all allusion to the letter of Balmerino or his confession as he would the bite of a Rattlesnake; and that, after this unfortunate secretary had been convicted of treason, and had undergone a slight imprisonment, his sentence, as stated by Burnett, was remitted, and he was restored alike to his estate and blood.§ These facts are a volume of argument.

In the following passage, Higgons affirms that Burnett's words mean to convey the infamous insinuation that James was the author of his son's death. His object, however, was simply to state that Prince Henry died by poison, according to his belief, and that Somerset, the king's unworthy favourite, had caused it to be administered to him:—"Prince Henry was a prince of great hopes, but so little like his father that he was rather feared than loved by him. Whether his aversion to popery hastened his death or not I cannot tell. Colonel Titus assured me, that he had from King Charles the First's own mouth, that he was well assured that he was poisoned by the Earl of Somerset's means."** In the first assertion, Burnett is supported by the most satisfactory authority, since, both

* See the *Staggering State of the Scots Statesmen*, by Sir John Scott, p. 60.

† See *General Hist. of Scotland*, vol. ii., p. 29.

‡ Caldewood, p. 600, 604, 605.

|| Winwood's *Mem.*, vol. xi., p. 57.

§ "Balmenoche deyed of a fever and waikness in his stomache some few monthes after the death of his arch enimey and competitor Cicill Earle of Salisburney (after quhom if aney tyme he had survived as well talked by them that best knew the Kyngs mynd) he had beine in grater crydit with his master than ever." Balfours MSS. as quoted by Guthrie, vol. ix., p. 53, 56.

** *History of his own Time*, vol. i., p. 18, 19.

at home and abroad, the prince's death was considered as a great national loss;* but so little did the king seem to be affected by it, that, after a short interval, all persons were forbidden to appear before him in mourning; and special directions were also issued that the preparations for the Christmas festivities should meet with no interruption—while, three days after Henry's demise, Rochester had orders to direct Sir Thomas Edmonds, at Paris, to open overtures for a marriage between Prince Charles and Christine, the second daughter of the late King of France; but a sense of decency and a sense of general reproach prevented the ambassador from complying immediately with these instructions.

The following letter of the Earl of Dorset to the same ambassador is particularly deserving of remark:—"That our rising sun is set, ere scarcely he had shone, and that with him all our glory lies buried, you know and do lament as well as we; and better than some do, and more truly, or else you are not a man and sensible of

* Few eyes were dry, few hearts untouched, if we are to believe the Secretary of Sir Thomas Edmonds, at the loss "of the flower of the house, the glory of his country, and the admiration of all strangers, which in all places had imprinted a great hope in the minds of the well affected, as it has already stricken terror into the hearts of his enemies." So writes M. Bulieu to Mr. Trumbolt, then President at Brussels. The Universities lamented the Prince in sermons and Latin orations. Chapman, Webster, Heywood, Withers, Maxwell, and other poets of his day, sang his praises. One, however, of the tribe, was silent on the occasion—"the rare Ben Jonson." A circumstance which will contribute to justify the general belief, that James was more willing that *England's darling*, as the Prince was styled, should be decried than extolled; for though Jonson was not appointed Laureate, yet he was the Court Minstrel. The following strains for extravagant conceptions out-top all that we have met with in poetic commendation of Henry.

"See where he shineth yonder
A fixed Star in Heaven
Whose motion here came under
None of the planet's seven.
If that the Moone should tender
The Sun her love and marry,
They both could not engender
So sweet a Star as Harry."

Verses written upon Prince Henry's death by Hugh Holland, Fellow of Trinity College, Cambridge, apud Laud, M. S. For the same prodigal use of laudatory superlatives in prose, see a Funeral Oration entitled "*Lacrymæ Tumulo nunquamsatis laudatis Heroes Henrici Frederici Stuarti a Gualtero Doraldsono Scoto.*" Brit. Sedani, 1613.

this kingdom's loss."* Sir Robert Naunton, the avowed partizan of Rochester, likewise clearly demonstrates that all was not right between the father and son; for these are some of the mysterious sentences of that secretary of state in his letter to Winwood:— "Touching our palladium which we have lost, I hold it neither fit to write what I conceive, and less fit to be written to your lordship. It is given out by his confidant, that he had a design to have come over with the palsgrave, and have drawn Count Maurice along with him with some promises, and done some exploit upon the place which shot the palsgrave's harbinger, and happily to have seen the landgrave's daughter, or I know not what. That this he meant to have done, whatsoever it was, '*clam patrem et senatum suum*,' unknown to his father and the council, and hatching some such secret design, which was made subject to misconstruction, it is now become abortive, like that of Henry IV. of France."† None of the cordialities of affection existed between Henry and James, as may be easily collected from the angry manner in which the proceedings of the latter were arraigned by his immediate heir. For thirteen years Sir Walter Raleigh had been shut up a prisoner in the tower by order of the king; "and what other king," was the indignant exclamation of the prince, "would have shut up such a bird in a cage."‡ Upon other occasions, Henry pertinaciously differed from his father, finding many practices in the conduct of affairs which he would not approve, and some of which he could not forbear to oppose.‖ Tutored, also, by his mother, the prince openly ridiculed the follies and weaknesses of James, which, joined with his high daring, his warlike propensities,§ his hatred of popery,** and his desire to reform the Reformation itself,†† were all so many estrangements from paternal love.

* See Birch's *Life of Prince Henry*, p. 405.

† Winwood, vol. iii., p. 410, &c.

‡ See Coke's *Detection*, p. 37.

‖ See Carte's *History of England*, vol. iii., p. 747, and Birch's *Life of Prince Henry*, p. 405.

§ In a letter which Henry addressed to the Prince de Joinville, he observes that he had sent him a present of the two things he loved best, arms and horses, and when asked by the French Ambassador if he had any message for his royal master, the reply was, "Tell him what I am now doing, tossing the pike." Birch's *Life of Prince Henry*, p. 75.

** In the plenitude of his Protestant zeal, we are told by Sir Henry Nevil, he had vowed that never idolatry should come in his bed, and that he considered his sickness as a deserved punishment upon him, for having opened his ears to admit the treaty of a Popish match. Winwood, vol. iii., p. 416.

†† His Governor, Sir Thomas Chaloner, was supposed to be a great favo-

"When the expectancy and rose of this fair state expired," the feeling gradually stole upon the people, and at last came to be audibly expressed, that he was cut off by the arts of Somerset.* That great light of the law, Coke, even proceeded to throw out this significant hint whilst presiding at the trial of the favourite:—"God knows what went with the good Prince Henry, but I have heard something." From such a man, a suspicion of this kind was almost a sentence or judgment. We are not, therefore, to be surprised that the impression became so prevalent, not only among the people, but among many of high station, that the prince had fallen a victim to the treachery of Somerset; and as James had many more enemies than admirers, even his reputation was not spared in their conjectures.† It is no reproach, then, to Burnett, to have said that which

rite of the *Puritans*. But he wanted neither ability nor moral courage to discharge his duties ably as well as honestly to the Prince. "All parties placed great confidence in him." See *Short Account of Sir T. Chaloner*, Governor to Prince Henry, p. 3. He had a great turn for Natural History and Chemistry. The alum works at Gisborough which were established by him, show that his scientific researches were productive of real utility. Harrington, in reference to the prince's supposed leaning to the church views of Knox and Calvin, says in his *Nugæ Antiquæ*, vol. iii., p. 3, that this couplet was common with the people:—

"Henry the Eighth pulled down the abbeys and cells
But Henry the Ninth shall pull down bishops and bells."

* The depth of infamy into which that minister had sunk, may be estimated from the queen's venturing on the extravagant monstrous charge, that he intended to poison her, Prince Charles, and the elector palatine, in order to marry the electress to Lord Suffolk's eldest son. See Carte's *History of England*, vol. iv., p. 33. This circumstance also, it was said, made great impression upon her mind, that when Raleigh was applied to for a much talked of prescription of his, during the last illness of the king, he sent it with this message, "that it would certainly cure him or any other of a fever *except in a case of poison*." See Welwood's *Notes on Wilson*, vol. ii., p. 714. It is worthy of remark, that a far more renowned Prince had recourse to this medicine just before his decease, and that it served to prolong his existence for a short time. "Yesterday morning his majesty (King William the Third) expired in the arms of Mr. Sewell, one of the pages of the back stairs. He had been kept alive for five or six hours merely by the help of *Sir Walter Raleigh's cordial*, and was sensible to the last." See a particular relation of the sickness and death of his last Majesty, &c. London, 1702, p. 14.

† When Whitelocke repaired to Sweden as the English Ambassador, Christine spoke of Prince Henry's death in that way, as if she inferred a judgment upon the House of Stuart for it. See Embass. Ays. MSS., No. 49, p. 206.

all mouths, at the same time, were open to declare. But though his implied suspicions were made less invidious by the corroborative misgivings of many others, yet it must be admitted that he has here overlooked the important distinction between the truth of opinion and the truth of fact. What Hume has remarked on this subject appears to be founded on such sentiments as both nature and reason must approve. "If Somerset," he sagaciously asks, "was so great a novice in this detestable act that, during the course of five months, a man who was his prisoner, and attended by none but his emissaries, could not be despatched but in so bungling a manner, how could it be imagined that a young prince, living in his own court, surrounded by his own friends and domestics, could be exposed to Somerset's attempts, and be taken off by so subtle a poison, if such an one exists, as could elude the skill of the most experienced physicians?"* The only thing, indeed, which can furnish any plausible pretext for the idea that Henry was poisoned by the minion of the king, is to be found in the following story related by Sir Charles Cornwallis, treasurer to the prince, and is to this purpose: That Rochester had addressed a letter to the prince, in which he had signed himself "yours before all the world." Henry directed Cornwallis to reply to this epistle, but, perceiving, when he was about to fix his signature to it, that his treasurer had concluded in a very complimentary form, he ordered the whole letter to be recomposed, declaring that Rochester (for though he does not actually name him, yet it is beyond all question the reference is made to him only) had dealt with him unfaithfully and falsely, and that his hand should never attest what his heart did not dictate. In opposition, however, to these surmises, and others that are discoverable in the secret histories or memoirs of the time, respecting the death of this prince, there exists the most positive and authentic evidence, collected from the journal of his last sickness, and from the reports of the surgeons who opened his body, that he died of a malignant fever,† a disorder which probably would not have been fatal, had the

* *History of England*, vol. vi., p. 71.

† It is singular that Mr. Fox, if he had perused the discourse of Sir Charles Cornwallis on the life and death of Prince Henry, which contains a minute detail of all the symptoms of the prince's case, extracts from which may be found in Birch's Life, should have stated it as his opinion that he was poisoned. See letter from him to Lord Lauderdale in the preface to his History by Lord Holland. A high authority, the French ambassador, Spifame, in one of his dispatches to the Minister Puysieux says speaking on this subject, "I hold the death of Prince Henry to have been natural." Raumer *History of the XVI. and XVII. Cent.*, vol. ii., p. 222.

science of medicine, in those days, been sufficiently advanced to have treated fevers by cold affusion ;* instead of which, "Sir Theodore Mayerne, a French physician, and in great esteem, would have let blood." These continual bleedings, therefore, destroyed a prince "whose sun went down while it was yet day."

Higgons again grossly calumniates the bishop in the following sentence :—"I should not have laid so much stress on this matter if the author had been speaking of any other person but King James, against whom he had so inveterate a malice, as is evident by the barbarous, unjust character which he gives of that prince."† But if this were the deep and abiding feeling in the mind of the bishop, we must find it altogether impossible to reconcile ourselves, among other remarkable omissions in support of James's reputation, to his silence respecting the prosecution of Peacham, a clergyman in Somersetshire, which, above all this king's iniquitous acts, breathes the odious principles of pure, unmingled despotism. Here was the happiest opportunity presented to our historian of showing, what sounds like a monstrous and shocking exaggeration, that the British Solomon had a heart as weak as it was obdurate and wicked. A more wily tactic could not have been attributed to the most eulogistic biographer of "the pedant reign,"‡ than to have treated that

* See Dr. Currie's *Medical Reports on the effects of Water, cold and warm, as a remedy in Fever ;* a performance which is strikingly indicative of the general ability of this eminent man in his profession.

† *Remarks*, p. 23.

‡ Bolingbroke has justly observed, "that his pedantry was too much even for the age in which he lived," and perhaps it would have been almost found repugnant *Academicæ Disciplinæ*. Lord Dartmouth on the information of the Earl of Mar thinks proper to assert, "that King James's pedantic education was designedly given him to make him contemptible both at home and abroad." Notes upon Burnett's *History of his own Time*, vol. i., p. 12. But this opinion does not harmonize with our convictions. It was one of the chief concerns of the Scottish state to provide suitable preceptors for their future monarch. Under that highly gifted man, George Buchanan, the young king was instructed in the liberal studies, rhetoric, logic, history, particularly modern history; also in the learned languages, and in geography and astronomy. Moreover, to inspire his royal pupil with views and sentiments fitted for his exalted station, and to enable him to play a higher part than "the wisest fool in Europe," as he was styled by Sully, Buchanan endeavoured with emphatic enforcement to make history one continued comment and exemplification of this now acknowledged principle, that princes govern not for their own advantage, but for that of their people. See his famous treatise *De Jure Regni apud Scotos*. If there had been, then, the disgraceful project to dwarf the intellectual growth of James, to stunt his energies, to disable his understanding, Buchanan could never be fairly accused of becom-

worst of his proceedings, as Burnett has done, as matter exciting no attention, and therefore to be passed over as never to be known; whereas, from the publicity and interest given to Peacham's case, in consequence of the Chief Justice Coke's dispute with the king and Bacon, then attorney-general, respecting extrajudicial questions to the judges, he must have felt that he was swerving from the line drawn by historical justice, in not presenting his readers with a full and fair account of this abominable transaction. A manuscript sermon had been found in the study of Peacham, which he had not preached, and which, we learn from Judge Coke, he had never intended to preach. In this discourse he complained of the kings's expenses; of his keeping divided courts for himself, his queen, and his son; of his gifts for dances, feastings, and maskings; and of the frauds of his officers. For these censures, which, had they been published, might have amounted to a seditious libel, the puritan minister was tried for high treason, under the statute of Edward III. The old man—for he was above sixty—was put to the rack, and examined upon various questions, says Winwood, then secretary of state, *before the torture, under the torture, between the torture,* and *after the torture,* by express command of "the mild and gentle prince," for so he is styled by Sir Symonds d'Ewes, in his *Diary*. Yet Mr. D'Israeli, departing from his usual acuteness and love of historical truth, tells us that "he exercised his power without an atom of brutal despotism adhering to it."*

Now, aware, that any attempt to convert the overt act of writing a libel into compassing the king's death would be to flounder in absurdity, but determined to wreak his vengeance on the prisoner, James directed Bacon to procure the opinions of the judges, *separate* and *apart,* previously to the trial, and for the direct purpose of influencing their decision in behalf of the crown. With this unconstitutional command Bacon had the baseness to comply.

ing *particeps criminis,* however true it might be that the benefit of his instructions was defeated by James's sub-tutor, Young. Subtle, insinuating, penetrating, and tinctured with all that pedantic learning so much affected afterwards by James, this bad man soon found out that his young sovereign loved those only who were accustomed to humour and flatter him. Accordingly he connived at all his faults, paid a blind servile obedience to all his whims and wishes, and injured the best interests of his country by secretly cherishing in James that love of absolute monarchy which ultimately proved the destruction of his race. See Sibbaldi's *Comment. in Vitam G. Buchanani,* p. 20. Irving's *Memoirs of Buchanan,* p. 160, and M'Cries's *Life of Melville,* second edition, vol. i, p. 251—257.

* See *Inquiry into the Literary and Political Character of James I.,* p. 128.

The profligate logic employed by this master of official responsibility in the following letter to the king, and his disgusting indifference to every principle of our free constitution, require all our reverence for his great name to keep us, in this instance, from execrating it. "Truly by this time the English law would have been made a tradition," if there had not been a Coke to stand forth in defence of it. "We did first find an encounter in the opinion of my Lord Coke, who seemed to affirm that such particular, and, as he called it, auricular, taking of opinions, was not according to the custom of this realm; and seemed to divine that his brethren would never do it. But when I replied that it was our duty to pursue your majesty's directions, and it were not amiss for his lordship to leave his brethren to their own answers, it was so concluded; and his lordship did desire that I might confer with himself, and Mr. Serjeant Montague was named to speak with Mr. Justice Crook, Mr. Sergeant Crewe with Justice Houghton, and Mr. Solicitor with Justice Doddridge. This done, I took my fellows aside, and advised that they should presently speak with the three judges before they could speak with my Lord Coke, for doubt of infusion; and that they should not, in any case, make any doubt to the judges, as if they mistrusted they would not deliver any opinion apart, but speak resolutely to them, and only make their coming to be to know what time they would appoint to be attended with the papers. He [Coke] moreover said, which I noted well, that his brethren were wise men, and that they might make a show as if they would give an opinion as was required, but the end would be that it would come to this, they would say that they doubted of it; and so, pray, advise with the rest. But to this I answered that I was sorry to hear him say so much, lest, if it came to pass, some that loved him not might make a construction that that which he had foretold he had wrought."*

We must observe with concern, that the practice of converting the judges into counsel for the crown, so detrimental to the free uninfluenced and independent judgment of these high legal functionaries, was not the point against which Coke remonstrated: but it was the experiment of innovation in consulting them apart and in private, which produced his murmurings and complaints. And

* Upon Peacham's frightful case, and the legal discussions it originated, consult Lord Bacon's Works, vol. v., p. 336, Dalrymple's *Memorials and Letters relating to the Reign of James* I., vol. i., p. 62, 64, and Howell's *State Trials*, vol. xi., p. 870, 877.

yet James, who was here so intent in degrading the judges into the abject characters of the mere instruments of the crown, could, in a speech to his parliament in 1601, assert in the most unequivocal terms—and the assertion was highly just and proper—that "the doing any act that may procure less reverence to the judges, cannot but breed a looseness in the government and a disgrace to the whole nation." Surely, if James had not flattered himself that he had succeeded in his design of reducing the people at large, as well as the judges, into so complete a servitude that they had ceased to perceive the distinction between despotism and monarchy, he would not have ventured to utter such a public declaration as the above, and then, in the face of it, to insist upon the judges doing those acts whereby the law of the land was grievously infringed. But, that he never sincerely contemplated to render the judges anything but obsequious tools in their official capacities, may be clearly inferred from his employing the common law judges in acts of prerogative; upon which Lord Clarendon has pronounced the following manly and unanswerable sentence of reprobation:—"The damage and mischief cannot be expressed," says he, "that the crown and state sustained by the deserved reproach and infamy that attended the judges, by being made use of in acts of power:" and in the next page of his immortal work, he observes:—"In the wisdom of former times, when the prerogative went highest, never any court of law, seldom any judge or lawyer of reputation, was called upon to assist in an act of power. The crown, well knowing the moment of keeping those the objects of reverence and veneration with the people, and that though it might sometimes make sallies upon them by the prerogative, yet the law would keep the people from any invasion of it, and that the king could never suffer whilst the law and the judges were looked upon by the subject as the asylum for their liberties and security."*

Now, if it were so notorious that Burnett had passionately pledged himself to aggravate the royal failings, as he is charged by Higgons, whenever he speaks of James, would he have been content to omit the above-mentioned striking instances of scandalous and intolerable abuse of kingly power, which, when we calmly and impartially consider, must be regarded with a shuddering sense of abhorrence? What else, too, could be demanded in the most thorough-paced and unprincipled partizan of the degenerate monarch of Whitehall, than to drop all pointed reference to his systematic at-

* *History of the Rebellion*, vol. i., p. 124, 125, Oxford Edition.

tempts to controul and subvert the law, which would have our constitution, as the dying Brutus said of virtue, an empty name—to his forced loans and benevolences*—to his numerous oaths† and profane allusions—to his attachment to the cock-pit‡—to his deep potations at the table||—to his indecent caresses of his minions§—to his womanish** fears and credulity††—to his low curiosity‡‡—to

* To take a single instance, "The Benevolence goes on. A merchant of London had been a cheesemonger, but now rich, was sent for by the Council and required to give the king £200 or to go into the Palatinate and serve the army with cheese, being a man of *eighty years* of age." See Ellis's *Original Letter*. Second series, vol. iii., p. 240.

† So notorious were his habits of cursing and swearing, that even the players made them the subject of comment on the stage.—Boderie, tom. iii., p. 190, 197. The consequence was, that they were for a time expelled the capital.—Winwood, vol. ii., p. 54.

‡ "Il vit combattre les cocqs, qui est un plaisir qu'il prend deux fois la semaine.—Boderie, t. i., p. 156.

|| In the entertainment given by Cecil at Theobald's when Christian IV. of Denmark visited this country, his Britannic Majesty was so inebriated, "that when he got up and would dance with the queen of Sheba, he fell down and humbled himself before her, and was carried to an inner chamber, and laid on a bed of state."—See Harrington's description of this disgusting scene, *Nugæ Antiq.*, vol. i. p. 348, &c. His wet nurse was a drunkard. *Nutricem unam habuit ebriosam*, so says Sir Theodore Mayerne, *Memoranda of King James*, M.S., Sloane, 1679. This, with some, will constitute an apology for his indulgence in this vulgar vice.

§ Upon this most disgusting subject, see Harrington, Weldon, Osborne, and Raumer's *History of XVI. and XVII. Cent.*, vol. ii., p. 261, 266, and this short but decisive note of his noble Translator.—"It is difficult to read the passage without deriving the worst opinion of his habits and those of his favourites."

** The following instance of pusillanimity is perfectly ludicrous. "The gentlemen of Grayes Inne to make an end of Christmas on Twelfe night, in the dead time of the night, shott off all the chambers they had borrowed from the Tower, being as many as filled four carts. The king awaked with the noise, started out of his bed, and cried out treason, treason, &c., and that the cittie was in an uprore, in such sort (as is told), that the whole Court was raised and almost in armes, the Earle of Arundell running to the bed chamber with his sworde drawn as to rescue the king's person. These are such things as I heard from Londoners, and so I leave them. Yours to commande, Joseph Meade."—See Ellis's *Original Letters*, vol. iii., p. 119.

†† "By the Dæmonologia" and "Counter-blast," observes Grainger, James lost as much reputation as he had gained by his Basilicon Doron. One of the first of his English statutes was an extension of the penalties against crimes of sorcery and witchcraft. "The arguments of tyranny," says Burke, "are as contemptible as its force is dreadful." It constitutes a spectacle equally absurd and horrible, that above an hundred persons should have fallen victims to the superstition of James.

‡‡ Nursery secrets as well as state ones were equally committed to the

his familiar correspondence with Buckingham,* which, upon most occasions, was so loose and full of gross buffoonery, as more fitted a jester or mountebank than the successor of the great Elizabeth—and to a court which was a general agglomerate of all licentiousness?† Upon these several subjects, mostly of moral antipathy and rebuke, Burnett manifests either a shyness in speaking, as if he were stepping out of his province by so doing, or a heartless assent, in the place of godly intrepidity of censure. One might have reasonably imagined that each and all of these striking facts would have disgusted him excessively; so that he could not have even glanced at them without the true sparks of indignation "kindling as he ran." To affirm, then, that he ever yields to the suggestions of malice at the mention of James—that he is here ready deliberately to sacrifice truth, honesty, and candour at the shrine of his dislikes and malignities—is to give as unfair a representation of our historian, as the artist would of his personal appearance who should represent him as a negro with a black face and woolly hair.

But if the cloven foot of malice were so unblushingly apparent, why, also, has Burnett omitted some important historical materials, which would further demonstrate the justice of his opinions on the

ears of this inquisitive king. See the ridiculous letter of the Duchess of Buckingham to him concerning "the weaning of Mall."—Dalrymple's *Letters*, &c., vol. i., p. 179.

* This sovereign of the sovereign whom Sir Edward Coke blasphemously called our Saviour, says Clarendon, could not have paraded with all his irreligion, the utterance of so many blasphemies in his correspondence with James, if he had not been pretty certain that his epistolary effusions, without being seasoned with a touch of them, would have been dull and tasteless to the royal palate. Why a man in these days would be hooted down for a fool or atheist even in the purlieus of St. Giles, if he were to express himself in the manner in which Buckingham did to James respecting the Father, Son and Holy Ghost, and the fruits of Paradise.—See *Hardwick Papers*, vol. i., p. 464, 468. In the dispatches of Count Tilliers, the French Ambassador in London, whose general representations of the Court affairs do great credit to his acuteness and accuracy, the "fiery Duke" is thus alluded to. "His will and pleasure pass for statute and prescription, and in place of his influence soon decreasing, as was expected, it increases daily to that degree that several (in the absence of a sufficient solution), believe that the king has been bewitched."—See Raumer's *History of the XVI. and XVII. Centuries*, vol. ii., p. 268.

† For the honour of royalty we could heartily wish that that celebrated woman Mrs. Hutchinson were chargeable with dealing in exaggerated language in that part of her description of the Court of James in which she says, "the generality of the gentry of the land soone learnt the Court fashion, and every greate house in the country became a stye of uncleanliness."—See *Memoirs of the Life of Col. Hutchinson*, p. 59.

character of James? He would have expatiated triumphantly upon them, it may be said, if he had been acquainted with these facts. Admitting this to be the case, we shall exhibit them to the notice of the reader, not merely because they help to deepen the chorus of testimonies against James, but because this truth becomes in a ten-fold degree more perspicuous that Burnett has not transgressed the bounds of moderation and charity in judging of the king. In the height of his admiration for the "sovereign author," Mr. D'Israeli would have us believe—for he really seems disposed to represent him as the almost faultless model of a king, one of the *deliciæ humani generis*—that all the sentiments of his hero were most lofty and philanthropic—that there was a thoughtful humanity—that he sat enthroned in goodness as in power—and that when compelled to launch the state thunder, mercy always tempered the bolt. "His platonic conceptions," he says, "inspired the most exalted feelings; but his gentle nature never led to *one act of unfeeling despotism*. His sceptre was wreathed with the roses of his fancy; the iron of arbitrary power only struck into the heart in the succeeding reign. James *only menaced with an abstract notion*;* or, in anger, with his own hand would tear out a protestation from the journals of the commons. And when he considered a man as past forgiveness, he condemned him to a slight imprisonment, or moved him to a distant employment; or, if an author, like Coke and Cowell, sent him into retirement to correct his works."† We, however, are greatly mistaken, if we have not in James's conduct positive proof that the praise thus claimed for him is not his right.

In a collection of criminal trials of Scotland, recently given to the public by Mr. Pitcairne, the reader will find some statements relative to James VI. of Scotland, in which there is despotism in its worst form. "His conduct," observes an acute historical critic, "was an uniform system of tyranny, prosecuted according to his talents."‡ Judging, then, from facts, we are necessitated to infer, that, whatever indifference or neglect the Scottish monarch might have shewn to the rights of others, when his own person or under-

* This assertion will surely not be deemed quite correspondent with facts, when it is remembered, that at the very commencement of his reign, James sentenced a thief to the gallows without trial or defence. "I hear our new king" says Sir John Harrington, "has hanged one man before he was tried; it is strangely done—now if the wind bloweth thus, why may not a man be tried before he is hanged."—*Nugæ Antiq.*, vol. i., p. 180.

† See *Inquiry into the Character of James, &c.*, p. 128.

‡ See Millar's *Historical View of the English Government*, vol. iii., p. 176.

standing was reflected upon, he was, while affecting horror of blood, as prompt and resolute in his criminal undertakings as others were in the pursuit of virtuous objects. On such occasions, the law which carries water down a descent was not more irrevocable and fixed than James in his determinations. Upon these three men, John Dixon, John Flemyng, and Francis Tennant, he wreaked his vengeance on account of offences for which, if there had been one elemental particle of generous feeling in his breast, an appeal to it for pardon would have been irresistible. We will detail the case of the last person, as it proves that James, in his eager desire of revenge, was quite as regardless of public disapprobation as they are who, having nothing to lose, are indifferent to the consequences of their actions:—Francis Tennant, merchant, burgess of Edinburgh, was indicted on the 10th of October, 1609, for writing slanderous pasquils against the king. What these pasquils were, it has baffled the indefatigable researches of Mr. Pitcairne to discover. We are instructed, however, to believe they were of a very culpable nature, as the lord advocate refused to name them in process, although he demanded a verdict for these pasquils without the facts of the case being even known to the judges. From these offensive papers being addressed to Mr. Robert Bruce and Mr. John Davidson, ministers in Edinburgh, Mr. Pitcairne conjectures they had reference to the proceedings on the part of James to force the clergy of that capital to avow their belief that his majesty was in imminent peril from the Gowrie conspiracy. Tennant's sentence was death, and a warrant was signed by James, declaring that the delinquent was to be taken to the market cross, his tongue cut out, a paper fixed on his brow, setting forth his crime, and then he was to be hanged:—"He shall be takyn to the mercat crose of Edinburgh, and his toung cuttit out at the rute; and that thair sall de ane paper affixit upon his brow, bearing that he is convict for forging and geveing out of certaine vyld and seditious pascallis, detracting us and our maist nobill progenitouris; and thairefter that he sall be takyn to the gallous and hangit, ay quhill he be dead." This warrant, however, is rescinded by the merciful king, and, by a rare stretch of his clemency, the culprit is allowed "to be hanged with his tongue in his mouth."

With respect to Higgons's assumption that Burnett is totally unworthy of belief when he asserts James's ardent attachment to the doctrine of the divine appointment of kings, we need only appeal to the writings and speeches of that monarch in testimony of this assertion. How complete was the conviction of the *English Justi-*

nian, as some of his admirers have absurdly styled James, that as kings reigned by the appointment of heaven, so to resist their commands, just or unjust, was opposition to the divine will, is evidenced in almost every page of his singular performance, *The Law of Free Monarchies*. The whole treatise is, indeed, an unvarnished and elaborate exposition of the duty of passive obedience on the part of the subject, without any qualification or restriction whatever on the part of the prince, and a claim to absolute unconditional power. Never was the title of a book more calculated to mislead the reader, since it conveys a meaning quite different from that which we are accustomed to annex to the foregoing precepts; it being the drift and scope of the royal author to give the English people a clear idea of a government directed by the sovereign, released from every check or controul, or, as James aptly designates him, "a free and absolute monarch," such as he appears in the constitution of England, as is laid down in the writings of prerogative lawyers,* where he is an ideal king above law, and not a real king subject to law.

This monarchical theory of James, in which he communicates to his own person a legal and religious character at once despotic and divine,† was made by him so much the idol of his affections, that he

* In reading Blackstone's *Description of the Powers of the Royal Prerogative*, vol. i., p. 160, 162, one fancies that we are perusing those dicta of the ancient lawyers which make the king of England an absolute sovereign.

† The extremes to which James pushed his ultra monarchical ideas, has led the Republican Historian Harris to say, "that he entertained notions of his prerogative amazingly great, and bordering on impiety." But in adorning his person "with some sparkles of divinity." it must in justice to James be remembered, that under the Norman, Plantagenet and Tudor line, we have the same pretensions of reigning by divine right, and therefore of being accountable to none on earth. True also it is, that Bracton and the author of Fleta, represent the king as the vicar of God and substitute of Christ upon earth; but then lest flattery should draw improper influences from these titles, they again tell us, when they speak of a real king, and not of the theoretical prerogative of an ideal one, that the law is superior to him, and by which he is made a king. "*In populo regendo*," says the last writer, *superiores habet (rex) per quam factus est rex.*"—Lib. i., cap. 5. It ought never to be forgotten indeed, that these two most learned, and as Warburton justly observes, "almost the only learned of the ancient lawyers." (See Letters to Hurd, p. 193). So far from allowing Despotism to find favour in their eyes, give a decisive evidence for our free and limited government, and deduce what some with extreme deficiency of information have stigmatized as a modern theory, and others, though versed in legal lore, have contemplated with a sort of horror as haters of Democracy, the origin of civil power from the people.

sought to palm this belief upon the intellects of his subjects, that next to the knowledge of their God, it was necessary for them to know the things contained in his book; while so numerous are his allusions to this topic in his speeches, that, in making choice of the following examples, we are guided chiefly by the shortness of the passages:—"The power of kings," he told the parliament, "was like the divine power; for as God can create and destroy, make and unmake at his pleasure, so kings can give life and death, judge all, and be judged by none."† And in a speech made in the Star Chamber he asserts, "It is atheism and blasphemy to declare what God can do; good Christians content themselves with his will revealed in his word: so it is presumption and contempt in a subject to dispute what a king can do, or say that a king cannot *do* this or that."† A more undisguised picture of a love of absolute sovereignty cannot well be placed before the eyes of the reader than in these sentences. Nevertheless Higgons will step in and beg him not to infer so and so, because he can assure him that the fact is otherwise.

The essence, we would say, of James's inordinate love of arbitrary authority is concentrated in this striking fact, that, during twelve years of his reign, we have two hundred and fifty proclamations without a single statute. True it is that James, in his speech to parliament, April 5th, 1614, designated, from its surprizing kindliness and concession, "Flowers of Grace," disclaims the doctrine of giving the strength of law to his proclamations. "As touching proclamations, which, in the last parliament, were excepted against, as he is a traitorous subject that will say a king may not proclaim and bind it, so did I never intend proclamations to have force of law,

* To demonstrate to his people, that justice emanated from him really as well as theoretically, James actually sat with his judges in Westminster Hall; but subservient as they all were to his arbitrary will, with the exception of Coke, he was told by the ermined sages, he could not deliver an opinion.—See Blackstone, vol. iii., p. 41. "It is a remarkable fact," observes Mr. Allen in his admirable work, *An Inquiry into the Rise and Growth of the Royal Prerogative*, p. 98, "that the same reign which for the last time exhibited a king of England interposing in his own person in the administration of justice, should also be the last during which he could be sued like a subject in the courts of law."

† See King James's Works, p. 557. The patriots of the day, in consequence of James having drawn a veil for awhile over liberty, began to be apprehensive they should not leave to their successors that freedom they received from their forefathers, "nor make account of any thing longer than they listed that governed."—Winwood, vol. iii., p. 175. And well indeed they might.

but to prevent sudden mischiefs arising wherein the law hath not provision, until a parliament can provide." But what was this sentimental talk? A mere gilding of the greater grievance of his setting up the civil above the common law—of prohibiting that which was not prohibited—of making no difference "between Middlesex and Morocco"—and, as Clarendon pointedly remarks, of "urging reasons of state for elements of law." Little did James think how indignantly, in the next reign, this kind of distinction would pass for a thing to be loathed by one half of the peers who then, perhaps, assented to it, being a thing so hateful to the common law. "Sergeant Ashley was committed to the Tower,* by the House of Lords, only for asserting in argument that there was a law of state different from the common law: and the "ship-money judges" were impeached, first, for conceiving it might be fitly and safely held, that state necessity would justify the raising money without consent of parliament, and secondly, that the king was judge of that necessity; while the article against Sir William Berkeley was for saying there was a rule of law and a rule of government."†

In his very first parliament, indeed, James showed himself to be utterly indifferent to the policy and justice of maintaining a constitutional government, by attempting to over-rule the electors of the Commons. But this house was not so controllable by his will, or subservient to his designs, as he fondly anticipated, since they were fast progressing in political knowledge. Sir Francis Godwin had been chosen member for Buckinghamshire. His fitness, however, for a legislator, not assimilating with the pattern for that function given by James in his proclamation, the Court of Chancery declared his seat vacant, and, in obedience to its fiat, the county selected another representative. But James, though he may have bowed the spirit of his subjects, had not broken it. For his sturdy Commons set at nought the mandate of the Chancery Court, and persisted in the eligibility of Sir Francis; while, in return for his majesty's most absurd and illegal proclamation, they sent him a remonstrance, the following sentences of which should have served as a beacon and warning to James that their eyes were not so easily to be hoodwinked as he imagined, in matters pertaining to their constitutional rights and privileges. "That, until the reign of Henry the Fourth, all parliament writs were returnable into parliament; and that, though Chancery was directed to receive returns, this was only to

* 3, Carol. I.

† See Rushworth's *Collect.*, vol. ii., p. 609.

keep them for parliament, but not to judge in them;" that the inconvenience would be great if the Chancery might, upon suggestions or sheriff's returns, send writs for new elections, and those not subject to examination in parliament: for so, when fit men were chosen by the counties and boroughs, the lord chancellor or the sheriffs might displace them, and send out new writs until some were chosen to their liking—a thing dangerous in precedent for the time to come."*

M.R.S.L.

(The Second Chapter will be concluded in our next Number.)

CRITICAL NOTICES OF NEW PUBLICATIONS.

The New Botanists' Guide to the Localities of the Rarer Plants of Britain. By Hewett Cotterell Watson; 8vo. London, 1837; Vol. ii. pp. xxiv, 267.

This Volume completes Mr. Watson's *New Botanists' Guide*, and also the execution of his self-imposed undertaking which must have been as laborious as its accomplishment is happy and commendable. It comprises the *Localities of the Rarer Plants of Scotland and the adjacent Isles*, and an ample Supplement to the first portion of his Guide already published. Eighty-one plants with their localities are assigned to the Isle of Man, on the authority of lists communicated to Mr. W. by two friendly correspondents. One of these transmitted, with his catalogue, a small "botanico-geologic chart" on which the island is thus described.

"The Isle of Man is thirty miles long, by about twelve at its broadest part. The greater portion of the island is composed of clay-slate, which at the sea-coast, is overlapped by greywacke and transition-slate. At its north point there is a large tract of sandy marl: this is almost flat, and its central

* *Parliamentary History*, vol. 5. Mr. Hume's *ipse dixit* may be very safely discarded, when he says, "there was reason to believe that this measure being entered into so early in the king's reign, proceeded more from precipitation and mistake, than from any serious design of invading the privileges of parliament," since he must have learnt from the *Basilicon Doron* that he took possession of the English crown with the resolved purpose to maintain the most absolute principles of monarchical power.

part is covered by peat bogs. Sandstone appears at Peel, and the peninsula of Langness is partly composed of sand. At Castleton, the coast is formed of a bed of transition-limestone, the only example of that rock in the island. Beds of peat are interspersed amongst the clay-slate, presenting the same botanical characters as those on the sand. The greatest elevation to which the slate rises is that of Snaefel, which towers to the height of two thousand and seven feet above the level of the sea. The mountainous district generally presents elevations of from one thousand to sixteen hundred feet, but it is unproductive of botanical treasures. There are several species of plants which are common in most places, but which are wanting altogether in this island: these are, the Lamium album, Galium cruciatum, Veronica hederifolia, Alchemilla vulgaris, Geum urbanum, Linaria vulgaris, and others."

After the plants set down for Scotland, come those for the Orkney and Shetland Isles; and, at the end of these, Mr. Watson requests the assistance of botanists in enlarging the catalogue of Shetland plants, so as to render it more complete. Then follows a list of Scottish Species, with reference to the counties under which they are mentioned. It occupies nineteen pages and contains a distinct enumeration of six hundred and sixty-five plants drawn from two hundred and ninety-eight genera whereof an alphabetical index is subjoined. Next in order, stands the Supplement for England and Wales, and this is fraught with much additional and valuable information. The number of species in each county list, for Great Britain and the Islands, amounts to considerably more than twelve thousand, as exhibited in a curious analytical table. It will remain for practical Botanists to estimate the extraordinary amount of mental concentration, exercised on a stock of patience almost inexhaustible, which Mr. W. must have devoted to the preparation of the separate constituent articles of his Guide. If they do not reward, with the highest meed of praise at least, their instructor who has shown himself so zealous, they will incur the charge of being reprehensibly ungrateful. As to his accuracy and faithfulness, let these be tested by experience: valuing highly the authority of two respected and indefatigable botanists often quoted, we can rely on the lists for Leicestershire and the adjacent districts, with unbounded and thankful confidence.

In the Introduction to his first volume, Mr. Watson professed distinctly that he entertained two objects, in publishing his work. His *first* and most desired object was—to ascertain the mere areal distribution of the vegetable species, by making a series of local lists from such materials as were placed within his reach: his *second* aim was—to render his compilation or more justly his composition, an accurate and convenient guide-book to the localities of the least common plants; while, in being fitted to combine easily with the former, it would add considerably to its usefulness. This arrangement created the necessity for his repeating the names of plants in the lists for counties in which they are abundantly frequent, and also for mentioning such vague localities as *Somerset, Bristol, Norfolk* and the like; but, though useless indications to mere collectors, such notices are very properly intended by him to record the fact of

the plants being found in the county or vicinity pointed out—a fact which will prove exceedingly advantageous to any one investigating the distribution of the species. Besides, since the *New Botanists' Guide* was designed to shew both the localities and the areal distributions of all species entitled to be called *Rare*, with reference to Britain in general, it became necessary that the author should mention them in *all* the counties within which they were certainly known to grow, although they might be common in some *particular* county. The propriety and advantages of this plan are sufficiently obvious, and it is equally manifest that Mr. W. has succeeded in working it up to an astonishing stage of perfection.

Although the method may not be altogether unobjectionable, Mr. Watson has preferred that of selecting a certain set of species according to a fixed test, and then tracing them through the whole of Britain; and, with unquestionable justice, he claims for this process the merit of a decided improvement, inasmuch as it affords the negative evidence available to the botanical geographer. Another peculiarity of his plan, is the exclusion of all the cryptogamic plants. As some persons may regard this as a defect, he wishes them to bear in mind that scarcely one in six of our botanical collectors feel equally interested in the cryptogamian tribes as they do in the others, unless it be for the ferns; but, he suggests, the defect or omission can be remedied by any one who is anxious to have it done, and is willing to bestow on it the requisite time and trouble. Let us hope that the recommendation may be adopted.

With regard to a line of distinction between *Rare* and *Common* plants, that adopted by Mr. Watson is sufficiently determinate; and, in the present extent of our acquaintance with the intricacies and anomalies of Local Botany, it appears clearly to be the best. He remarks judiciously—that, between the least rare of the rarer plants and the least common of the commoner plants, there can only be a shade of difference, and any adopted test will fail of extreme precision; but, in cases where the rarity or commonness of a plant is indistinguishable, it becomes a question of small moment whether it be admitted or rejected, for a distinction. For the Test in his guide-book, Mr. W. has adopted the comparative frequency of a plant in the *Local Floras* he has consulted: it is the substitution of the average observation of several good investigators in different places, for the partial observation of one individual. As yet, the local catalogues are insufficient, in number and extent, for the attainment of complete precision; and therefore, so long as this deficiency remains unsupplied, it is not too much to aver, that the *New Botanists' Guide* will continue to afford the most faithful test for the plants which it enumerates.

Finding that he might be required to answer the question *what useful result is to ensue from such investigations into the distribution of plants*, Mr. Watson tenders his reply in the following instructive and pertinent observations.

"The ultimate tendency of Botany, as of any other science worthy of cultivation, should be found in some beneficial results to the human race, equivalent to the cost of time and money expended on the pursuit. Unless some such results be in prospect, however distantly, it is difficult to conceive what adequate advantges are to be derived from our sedulous efforts to describe and give names to every peculiarity, form and proportion in plants; from our voluminous collections of specimens, dried and living, including the productions of nearly every clime and country; from our intense devotion to the devising of systems and classifications; and from the great expense of time and money necessarily made in effecting all this. Unless there be some prospect of an equivalent return, some reasonable hope of thereby eventually adding much to the stock of power and enjoyment which mankind at present derives from the vegetable world, it will be the duty of political economists to stigmatize botanists as the unproductive consumers or supernumerary drones of society. Now, mere descriptions, mere classifications, mere invention of names, howsoever complete and ingenious, produce nothing to the human race. They only consume time and labour: and, although such occupation may be an agreeable amusement to the parties personally concerned in it, yet, taken alone, it is as valueless to the world as would have been their occupation for an equal length of time at a card-table. We cannot make the earth yield a greater quantity of food and clothing, through means of its vegetable productions, merely by knowing their names, resemblances and structure. After learning these things, which are not to be undervalued as a groundwork for something more, we must still take other steps, by studying the relations existing between vegetables and the rest of the creation. One set of these relations is found in the connections established between vegetation on the one hand, and the physical conditions of its existence on the other; that is to say, the influence of climate, soil and the other external circumstances determining the vegetation of the globe, whether general or special. The more we come to understand these connections, the greater will be our power of modifying them for our benefit. Hitherto, almost all our applied knowledge on this subject has been purely empirical; having been left to farmers and gardeners, who have derived little assistance from technical botanists. Experiments and accidental observations, with some aid from chemistry and mechanical inventions, have enabled practical farmers to augment and improve the vegetable produce of Britain; but, it is hardly saying too much, to suggest that a scientific knowledge of the laws of vegetation, though it will be slowly acquired, must place a future race of cultivators as much above the present workmen, in skill and power, as the scientific chemist of to-day is superior to the cooks and the drug-vendors who were the chemists empirically in the by-gone centuries. The collecting and arranging of facts, such as appear likely to bear upon one department of a study which may become so important to mankind has been my aim hitherto, as it has been the aim of others. No one has yet advanced a step beyond this preliminary labour, in so far as that one department is concerned; and no one can go beyond it, at present. An attempt to do so, would be only a leap from twilight into utter darkness. Even Humboldt himself, so deservedly honoured with the highest reputation as a phytologist, he only collected facts together, and those chiefly the facts ascertained by others, and made an imperfect generalization of them. He could do no more than this, and most assuredly he *built* no *system*; for, how can a system be built, before the constituent materials are half of them procured? Here then, is the answer in reply to the question of usefulness, construing this in a moral or public sense; but, if it were designed to have only an individual application, the reply must be put on the same ground, by reference to individual tastes. One class of minds derive their intellectual gratification from direct or simple observation almost exclusively: a second class of minds are more pleased by occupying themselves with the relations between objects or events. If plants become objects of interest, the former minds describe and classify them; while the latter may feel little interest in

descriptions and classifications, yet derive much pleasure from tracing the relations established between plants and animals, or between plants and their geographical positions. For one of these classes to decry the studies of the other, would be as sensible a proceeding as it would be for the historian to find fault with the moral philosopher, or for the anatomist to censure the physiologist, each because the other had a different taste and pursuit;" for, he might have added, the constitution of men's minds are as distinct and distinguishable as the shapes of their heads.

These excellent observations of Mr. Watson's are followed by a train of admirable suggestions, the result of experience and reflection, offered to the consideration of any future writer on the typography of our native plants. The high practical value of these suggestions will be readily and fully appreciated by those who may have endeavoured to exercise their ingenuity in perfecting the arrangement of even a limited botanical cabinet and its description. But Mr. Watson will prove unfaithful to his own reputation, and he will materially impede the advancement of his *second* most favourite science, if he shall now withdraw his improving hand from the "Botanists' Guide," for any reason save an unsurmountable necessity. By far the most laborious and difficult part of his undertaking is now triumphantly accomplished: let him, therefore, cease to contemplate an inglorious retirement: far rather, let him be persuaded forthwith to commence an easy and gradual distribution of the articles of his Supplement into their proper positions; and thus, with the contributions of all generous British botanists, he will be enabled ultimately to elaborate a "*new edition carefully revised and greatly augmented*," and printed on writing paper with very "*large margins*" for the insertion of MS. notes and observations. One more suggestion—*Watson began the suggestions*—might be offered; and it is this—that, if at all practicable, the British should receive an engraftment of the Irish phytography, beginning with the meritorious gleanings of Caleb Threlkeld* "that good man," and extending to the fruits of more fortunate researches, in later times.—There is not a book in our native language, better calculated than Mr. Watson's work to ensure the comfort and facilitate the success of an intelligent Naturalist, throughout the progress of a social or solitary botanical excursion.

* As Threlkeld's book was "the first essay of the kind in the kingdom of Ireland," and has now arrived at the honourable distinction of a place among the *Rare Books*, a brief notice of the author and his volume may be acceptable.—Caleb Threlkeld was born in 1676 at Keiberg, in the parish of Kirkoswald in Cumberland. In 1698, he took his degree of "Master of Arts," at the university of Glasgow, where he first experienced a predilection for physic and botany. Having completed the regular course of studies in 1712, he then obtained the degree of "Docter of Medicine" at Edinburgh; and, in the following year he removed to Dublin where he practised as a physician, during the remainder of his respected and exemplary life. His death took place in 1728, at his house in Frances-street, Dublin, and his remains were attended to the grave by the children of an Institution to which he had acted as physician. He was greatly regretted by the poor to whom he had been, both as a man and as a physician, a most kind and considerate bene-

factor.—Dr. Threlkeld's book is intituled *Synopsis Stirpium Hibernicarum alphabeticé dispositarum: sive Commentatio de Plantis Indigenis præsertim Dublinensibus instituta:* being a short Treatise of Native Plants, especially such as grow spontaneously in the vicinity of Dublin; with their Latin, English, and Irish names, and an abridgement of their vertues; with several new discoveries; with an Appendix of Observations made upon Plants, by Dr. Molyneux, physician to the State in Ireland: the first Essay of this kind in the Kingdom of Ireland: auctore Caleb Threlkeld, M. D.—*Est quiddam prodire tenus, si non datur ultra:*" small 8vo. Dublin, 1727. Dr. T. describes five hundred and thirty-five species alphabetically arranged according to their Latin names, unaccompanied by a regular paging. The appendix is paged, and has the sub-title "*Plants growing in Ireland not yet described,*" with the prefatory note—" there are more kinds of marsh and aquatic plants in Ireland, as also mosses, mushrooms and such imperfect plants, than there are in England, and in far greater plenty." Eighty-eight articles are inserted in this list, and it is interspersed with a variety of important and curious observations. Those on the Henbane, Winter-Barley, and Wood-Sorrel, deserve attention. Dr. T. affirms that " what some have suggested, that the Elm is a foreigner in England, and that it is not found northward of Grantham, is trifling and false; for, near the small river of Croglin in Cumberland, from the place where it disembogues itself into the Eden, up to the very Fells, I have seen the Elm grow, some of which are large trees, without any art or culture, and I dare say were never planted by man; it grows often so near the river that the boys could come at its bare roots to peel off the bark."

The Literary Beauty of the Bible, a Lecture delivered in the Literary and Scientific Institution at Staines, Tuesday, November 7th, 1837, being the commencement of its fourth season; by the Rev. Robert Jones, D. D., Vicar of Bedfont, and Vice-President of the Institution; 8vo. London, 1837; pp. 36.

Dr. Jones makes the title-page of his printed Lecture announce the time and place of its delivery: its object is explained in his introductory observations. He commences thus—

" It is the object of this lecture, to solicit for the Sacred Scriptures a place at least—if not the highest rank—in literary pursuits. The Bible has hitherto been considered too much in a single view—too distinct from liberal enquiries. But, is it instruction only in doctrine and in morals that can be found there? Surely, it merits a larger and more dignified treatment. May it not rank with literature, science, and the arts? May it not extend its empire from the heart to the understanding," in other words, from the affections to the intellect, " and assist in furnishing and embellishing the mind with those powers and graces which crown the philosopher and the scholar? It is for superstition to take refuge in wonders and tradition, or to seek the aid of arms; rather to constrain than persuade. It is for pagan idolatry, conscious of fraud and imposture, to bow down in silence at the feet of science and learning. But Revelation fears no comparison, and shrinks from no tests. As it is the beacon of our immortal hope, and the example of our daily conduct, let it be also the grand basis of our intellectual taste—the rich treasury to us, of all that is beautiful."

Instead of wandering into generalities, Dr. Jones marks out, with much clearness and accuracy, the grounds on which these claims are founded. For this purpose, he arranges his Enquiry under the

three heads—*Sentiment, Diction and Style, and Regularity of Plan*—and, in adopting this division, he follows the canons of sound criticism, as being applicable to every work possessing any pretensions to the name of literature.

I. *Sentiment.*—Under this term, according to Dr. Jones, may be comprehended the principles and opinions of an intelligent being, respecting himself and others. Such sentiment abounds in the wisest and most learned works of all ages and countries; but, however recommended by novelty, excellence or beauty, it cannot have that weight which the sentiments expressed in the Holy Volume so justly and so imperatively claim. The reasons of this superiority are obvious,—the veracity on which human sentiments are rested, and the sanctions by which they are enforced, are infinitely inferior; they cannot have the infallibility which pertains exclusively to the Word of God. Mankind, therefore, are constrained to pay immediate and implicit obedience to Scriptural sentiment, because it emanates from wisdom that is perfect and never errs.

Dr. Jones evinces with many apt and conclusive illustrations—that, for its exquisite adaptations to expand the mind, refine the taste, improve the understanding and judgment, beautify the life, purify and exalt the nature of man, the Scriptural Sentiment is supremely excellent, in all respects, over the highest and best instances of pathos or sublimity to be found in the stores of polite literature. He concludes this first branch of his lecture, with the observations;

"I conceive that this review of Scripture Morality comes within the legitimate range of my subject. If that which is pure and becoming in sentiment runs, like a golden thread through the philosophy of an Aristotle, or a Cicero, with what a more heavenly grace and dignity are the ethics of the Gospel clad. Classic philosophy may tell us to worship God, but Christianity adds—'*in spirit and in truth.*' If that would enjoin us to love our neighbour, how is the precept spiritualized and ennobled by the gospel-rule—'*to do good to them who hate us and despitefully use us.*" Let us suppose ourselves the auditors of the Sermon on the Mount, that practical summary of universal motive and duty. It furnishes, not merely an outward shew of goodness, often assumed from a sheer regard to respectability, but it tries the very thoughts and the conscience. With what sublime simplicity, with what homely allusions yet winning eloquence, with what an evident and ardent concern for man, are its precepts addressed. The instances of the true sublime and beautiful are not prized by us as they deserve to be; but were those adduced now for the first time disclosed, I should have little trouble in the enforcement of my thesis—*The Literary Beauty of the Holy Scriptures.*"

II. *Diction and Style.*—Dr. Jones manifests a vigorous activity of the faculty of language and its organ, while descanting on the excellency of biblical diction, and shewing this by reference and illustration. His transition from *sentiment* to *style* comes in these words;

"The very spirit of literary beauty depends so mainly upon the external form and dress of language, that words become things. So intimate and harmonious is the bond, that the very strength and beauty of the thought con-

veyed, arise from the mode of expression. The difficult, secret and happy effect of style consists in adapting the expression to the exact sentiment or sense intended to be understood. Herein centres the highest merit in speaking or writing—'to describe humble things with delicacy; great things with gravity; and such things as are alike removed from both, with equability and ease.' The Holy Scriptures are a wide and fertile field, in which all this variety may be found; and where else are they treated so strictly and so beautifully, in obedience to this rule? If the minutiæ of the Jewish law solicit our attention, they are related in a familiar way, and yet without the least approach to coarseness: but, if the subject be lofty, with what thrilling solemnity is its diction clothed: and, if a plain history of facts demands our attention, perspicuity of statement and artless eloquence invest the narration with an identity which no embellishment can command: vividly and graphically it comes before our view. The Scripture diction, moreover, is graced and diversified with remarkable peculiarities of style. If we select the great Apostle of the Gentiles; in his epistles, are united the concise and the beautiful: they are distinguished by a condensed and energetic expression, by a short but most impressive turn of sentence, wherein there is no dryness, or wearying sameness. St. Paul's style of writing is every way worthy of the greatness and diversity of his subject. At times, he seems to combine the separate excellencies of all the other sacred writers—the majesty of Isaish, the devotion of David, the pathos of Jeremiah, the vehemence of Ezekiel, the sublimity of St. John, the noble energy of St. Peter. Unambitious of ornament, his style is as varied as his discursions. He is, by turns, vehement and tender, didactive and impassioned: now, pursuing his argument with logical precision, and then disdaining the rules of which he was so complete a master—thus making his noble neglect more impressive and convincing than the most elaborate elocution. In his diction, the mass of thought, the mournful yet touching examples, the deep feeling, the holy melody of the language, breathe the very loftiness and fortitude they would inspire. Nothing can be more illustrative, and yet apposite, than his allusions and metaphors: he enforces on the Hebrews the doctrine of salvation through Christ, by a reference to the rites, ceremonies and economy of the Jewish dispensation. To the inhabitants of Achaia, how apt and beautiful is his illustration and how impressive is his moral when alluding to the abstinence required by competitors in the Isthmian games, he gives it a spiritual comment by insisting on the subjugation of unruly passions in the Christian combatant. The close of his analogy is eminently apposite and new, when he compares the value and duration of the frail and fading garland worn by the victorious Greek, with the incorruptible crown of the Christian conqueror. There is scarcely a beauty in style or expression with which Scripture diction is not enriched. With the most precise and logical brevity, it sometimes appeals to the judgment; again, it rises in dignity, and arrayed with all the gorgeous plenitude of imagery, it wins the fancy. While, in its didactic precepts, it stoops to the humblest mind, it delights and rewards the most cultivated taste, not merely of a Christian taught and schooled to admire and magnify what it loves and prizes, but the taste even of a pagan—and yet more, the taste of an infidel. Even the unbelieving Rousseau confesses that Socrates, the beloved idol of his insane devotion, fades into insignificance and nothingness, before the awful dignity, the matchless purity, the love, the charity, the humility, the holiness, the godhead of Jesus Christ. The fine imagination of this gifted writer was fixed with the *Sublime* of Christianity. And herein are exemplified its power and attractiveness; here is the influence of the Scripture style, arranged with all the grandeur of truth, the magnificence of reality. There is nothing so likely to win the heart as the disclosure of stupendous veracities; it needs, it employs no embellishment. Coarseness or want of taste has no affinity with piety: there is a severity, a solemnity, more subduing than wordy eloquence."

III. *Regularity of Plan.*—This last division of Dr. Jones's lecture is opened with some general remarks on the advantages of order and system in composition. Evidently expressing intuitive experience, he observes:—

"Though method and arrangement may be the more retired and secret fund of literary beauty, and known as well as prized by those whose large comprehension enables them to take wide and therefore accurate views, still order is ever pleasing, even to the humblest minds that cannot comprehend its symmetry and its rules. At the same time, the highest because the most intellectual pleasure does await him who can discover and value the various well-apportioned and adjusted sections of a system or a treatise, and observe with what adaptation and evidence each part conspires to develope, illustrate and confirm the main whole. Hence we find the admiration of critics, both ancient and modern, warmed indeed by the sentiment and diction of Homer, yet stimulated to a degree of enthusiastic admiration when their attention is turned to the identity of character, the consistent plan, the transparent method to be found in his two immortal poems. If plan and arrangement, the offspring of mere human talent, be attended with such a power, what may we not expect from the Divine mind? Let us therefore inquire, if this source also of literary beauty and delight is not to be found in the Holy Scriptures, which contain a mine of wisdom and of mercy; and, the further and deeper the search, the richer and more abundant is the reward. Can there then be any subject better qualified at once to satisfy and sanctify inquiry, than to trace out the mighty and mysterious clue of the Divine economy?"

With this most interesting inquiry Dr. Jones completes the last head of his lecture; and, like the rest, this abounds with observations well-calculated to secure the respect and improvement of the simple and the wise, of the unlearned and of them who excel in knowledge. Thus, he says:—

"We shall find the Bible to be the work of one Divine author, with its great and ultimate design carried on, through different dispensations, but still through human agencies and national events. That design commences with the beginning of time, and ends when time shall be no more. Naturally therefore, may we look for that unity of intention and specific purpose, which as the unerring proof of high intellect among men cannot but be expected in the perfect councils and word of God. What then do we absolutely find? We find, in the writings of Moses, that after a short but most impressive detail of Adam's primitive happiness and of his fall from that state of bliss and purity, the grand, the gracious object of all the succeeding dealings of God with man, is at once proposed—the promise of pardon to fallen man and his restoration to his Creator's favour. This, as the well-spring of life immortal, diffuses its healing streams through every page of the sacred volume: it hallows all its precepts, and evangelizes all its prophecies. Still, human means and agencies were called forth, under the divine guidance. The first step taken to accomplish this glorious end, was the selection of the Jews from the midst of an idolatrous and pagan world, sunk in vice and ignorance. Laws were ordained, and services appointed to preserve this people a peculiar and chosen race. The rites and ceremonies enjoined, had at once the effect of signifying better promises to come, while their observance kept up a civil and national distinction—a total identity. If again, we look to the prophecies, we shall see the designs of divine mercy gradually and more clearly developing, growing stronger and more explicit, on the approach of that glorious event which they predicted. If we carry the mind further, and

contemplate the actual advent of Him, '*the Desire of all Nations*,' with awe and admiration, we shall behold the means verified and lost in the fulfilment; prophecy completed; the shadow vanishing before the substance; the time, the place, the character of the Messias distinctly marked; the page of the Old Testament visibly and literally fulfilled in the New; the attestation of miracles; the calling in of the Gentiles; the out-pouring of the Holy Spirit; and the triumphant spread of the Gospel. Each and all of these circumstances contribute to prove the connexion, the harmony, the wisdom of design, and regularity of plan, which evince a wholeness, a oneness in the Holy Scriptures. Thus has my purpose been accomplished, in establishing the *Literary Beauty of the Bible*. Its two Testaments unite harmoniously to form one grand Epic; they concur in one transcendent uniform view; and come equally from the same divine intelligence. The *Sentiment* accordingly is of such wisdom and purity, the *Diction* is so varied and well-suited, the *Plan* so consistently conducted, and the *Object* so glorious and momentous in its fulfilment, that they cannot but be prized by every mind alive to literary perfection. Yet this is not the only excellence or the best fruit of sacred studies. Taste and beauty do not here, as on other subjects, merely satisfy the judgment, soften the manners and delight the imagination: here it is, that the heart is led captive to virtue, the weightiest motives are supplied, the life is made holy, the hope becomes immortal, the elegances of literature and the graces of religion go hand in hand, the man of science is no longer deceived by '*philosophy falsely so called*,' and the scholar is completed in the Christian."

With a most praise-worthy discretion, Dr. Jones has carefully and successfully, throughout his eloquent and persuasive Lecture, avoided the discussion of an exclusively theological subject; he has meddled with no sect; he has touched upon no doctrines except those which constitute the foundations of general christianity. In his own words—

"He has led you to the Scriptures, as unto a fount of pure and living water, to cheer and recruit you in your pilgrimage through this weary world. Our courage does become holier, and our intellects do become brighter from a daily study of the divine page. O, he fervently exclaims, "it is a paltry earth-born ambition which urges us on if, in Literary and Scientific Institutions, we seem ashamed of naming the name of God and of tracing up to one sole good and perfect Cause, the wonders, the mercies and the wisdom, clinging and clustering around our path, at every fresh step into the phenomena of Nature. Let us hurl back, with holy denial, the imputation—that this Institution must, in time, become a school of infidelity; that literature and science infallibly deaden the mind to sacred studies and the life to pious deeds and gentle charities. Let us then, in refutation of the charge, make Christianity the basis of all our endeavours to diffuse mental illumination. Knowledge, without religion, is power; but it is power which may be, and too often has been, employed banefully and ruinously. Let us remember, and justify, and courageously avow our Conviction, that 'righteousness exalteth a nation,' and that 'the fear of the Lord is the beginning of wisdom.' We are not afraid of facts, or the science which developes them; but we do resist and deprecate every unfair treatment of Holy Writ. Be as scientific as you please, but leave Scripture to its own evidence. Christianity is the Queen of Knowledge, the nursing-mother of all that is great and good. Wherever the Gospel, in its purity, is realized, there do learning, science and the arts take root and flourish. Let us not deify reason, for our idol will not avail us. Was a motto to be placed over this rostrum, I should choose, FEAR GOD AND HONOUR THE QUEEN.—On the subject of *Popular Enlightenment*, I am perfectly convinced that it is easily and delightfully practicable,

to be most true and faithful to the Church of England, and yet to be the zealous Champion of an outspread of knowledge, fenced and sanctified by religion, through the length and the breadth of the united kingdom."

There is not—assuredly there is not—a liberal heart within the limits of our own beloved Island, that will not respond with generous acclamation to the wise and philanthropic principles so earnestly as well as happily advocated in Dr. Jones' Lecture; and, at the same time, that will not offer up the most devout aspirations to the Supreme Source of all true knowledge and happiness, for increasing prosperity to the Staines' Institution, with the highest reward of philanthropy to its devoted and venerable Vice-president.

The Spirit of the Woods, illustrated by coloured engravings. By the author of *The Moral of Flowers*. 1 vol. 8vo. London, 1837.

"With gentle hand,
Touch—for there is a spirit in the woods."

Such is the advice of Wordsworth, which assuredly we will follow; not only because the work is the production of a lady, and therefore deserves to be handled gently, but because it is executed in a style to disarm the most ungallant critic who recognizes no sex in a printed volume. Yet we can scarcely understand how this can be; for cold must be the heart, and dull the eye, that feels not, sees not, at a first glance, and on the perusal of a single page, that we are indebted for this most elegant volume to the soft pencil and finer pen of a lady. How great is our privilege to be allowed to walk through the forest glades in company with one so deeply skilled in

"that language
Which flowers can speak—
Each hue a word, each leaf a thought"—

To which utterance is given in divers comments on the form, foliage, and effect, as regards the picturesque, the beautiful, and the sublime, of each tree we may encounter; the whole summed up in verse, tuned to the music of a thankful heart. And thus the strains which the children of the forest are made to breathe are more grateful to a rational spirit than when ancient poets spoke the language of the fabled dryads. With such an instructive guide would we wish to traverse field and holt, either

"in the youthful hour
Of spring, when every little flower
Its timid eye was closing;"

or

"when the stormy winds of winter
rouse

The wide old wood from his majestic rest,
Summoning from the innumerable boughs
The strange deep melodies that haunt his breast."

Without further preface, we will introduce the fair writer to our readers, in the following just remarks on trees in general :—

"Trees are full of moral associations, regarded under which impression, they possess even 'something than beauty dearer.' Many of them are rich in historic interest, and chronicle events of national importance; others confine themselves to a more limited range of observation, and recalling the memory of some renowned individual, lead us beneath their shade to 'hold converse with the mighty dead.' But where this pecular charm is wanting, imagination bodies forth scenes and stories of its own creating, and 'gives to airy nothing a local habitation and a name.' An aged tree points to the past—a sapling to the future; and whilst the mind is exercised in these remote contemplations, we feel the force of Dr. Johnson's well-known observation :—'Whatever withdraws us from the power of our senses—whatever makes the past, the distant, or the future predominate over the present—advances us in the dignity of thinking beings."

In working out her plan, she has freely levied contributions from other writers on trees, and assimilated many choice allusions of the poets to the subject under treatment. Something is, in this way, provided to suit every taste. Ample as are these quotations and the legends which they sometimes introduce, we could have wished, when speaking of the Aspen and the superstitions indulged in by rude nations as to the origin of its perpetual motion, she had noticed that prevalent in the north of Europe, viz., when Christ entered Jerusalem amid hosannas, every tree bowed its head but the stately and haughty poplar, which was, therefore, condemned to shake and tremble till the second coming of its Lord. This superstition has been adopted in a poem by Aehlenslager, which was ably translated in *The Foreign Literary Review* several years ago.

However willing we may be to indulge in extended quotation, our limits compel us to take the following on the Scotch Fir, not for its superiority over other passages, but for its shortness :—

But a higher and more honourable distinction belongs to the tribe in the frequent allusions made to it in Holy Writ; the Fir, along with the Cedar, was used for the planks and beams in the erection of the glorious temple of Solomon. And in many passages it is also associated with that noble tree in conveying images of prosperity and sublimity. From the sonorous quality of its wood, it is chosen, almost before any other, for musical instruments. Even in the early ages its adaptation to such uses was recognized; for we read when David brought up the ark from the house of Abinadab, he 'and all the house of Israel played before the Lord on all manner of instruments made of Fir-wood; even on harps, and on psalteries, and on timbrels, and on cornets, and on cymbals.' It is still used in our days for similar purposes; and in a fanciful view, there is a strange but beautiful anomaly in this braver of the tempest administering to the devotional and tender emotions of the heart."

"Thy throne a rock! thy canopy the skies!
And, circled in the mountain's dark embrace,

'Mid what stern pomp thy towering branches rise!
How wild—how lonely—is thy dwelling place!
In the rich mead a God of love we trace,
We feel His bounty in the sun and shower;
But here His milder glories shun our gaze,
Lost in the one dread attribute of power.
I cannot chuse but wish thou hadst a fairer bower.

"Yet, to the scene, thy stately form doth give
Appropriate grace; and in thy mountain hold,
Like flowers with zephyrs, 'at the shut of eve,'
Thou with the storm hast dallied from of old.
But stateliness of form and bearing bold
Are not thy only boast: there dwells in thee
A soft, sweet spell (if we be rightly told),
Which waiteth but the touch of harmony,
To soothe the brow of care, and make e'en sorrow flee.

"Thus be't with me! When storms of trouble rise—
Which all of woman born, alas! must know—
Built on a rock, and looking to the skies,
Like thee, undaunted may I meet the blow.
Not so when called to hear of others' woe:
Then may soft pity touch some chord within,
Prompting the tear of sympathy to flow,
And words of healing, such as gently win
The mourner's stricken heart, and pour soft comfort in.

The volume, which, in its outward embellishments, displays great taste, contains twenty-six coloured engravings of trees, from drawings by the accomplished authoress. Of these it is but justice to say that the outline of the foliage is most strikingly correct. Reluctant as we are to

"Hint a fault, or hesitate dislike,"

we cannot speak in the same unqualified terms of the colouring, since we have heard those to whose judgment we must bow in this point question its *truthfulness*. This fault, however, lies not with the authoress, and is easy of correction in the future copies and editions.

On the Natural History and Classification of Birds. By William Swainson, A.C.G., F.R.S., F.L.S., &c. Vol. II. London: Longman & Co., and John Taylor. 1837.

After the critical notices which we have from time to time given of Mr. Swainson's works, and considering the long acknowledged ability of that gentleman as a scientific zoologist, we shall, on the present occasion, confine ourselves to a few words; indeed, a considerable portion of the volume scarcely admits of analysis.

The early part of the book is dedicated to a continuation of the explanation of the orders and other larger groups of modern Orni-

thology, the *Dentirostres, Rasores, Grallatores,* and *Natatores,* being respectively and fully treated of in the most satisfactory manner. That a reviewer should coincide in all the views of his author is a thing not to be expected; we, accordingly, taking advantage of the undisputed privilege of our craft, had marked several passages whereon to comment. But the faults—if such they be—to which we allude are of minor importance.

The volume concludes with the characters of the various genera, briefly and concisely written. The illustrative wood-cuts are frequently less accurate than we could wish. Although they might "pass muster" with the generality of readers, they are, in many instances, not executed with that attention to minute particulars so desirable in a scientific work, and one intended to be standard. There are, likewise, several typographical errors, some of considerable importance.

On the whole we consider this volume by no means inferior in value to its predecessors. We will conclude by recommending that a little wholesome admonition be given to the engraver and to the "printer's devil," and by observing that our author's descriptions of new species will appear in a future volume of his admirable series.

A Lecture on Education, delivered in the Freemasons' Hall, at the Opening of the Second Session of the Edinburgh Association of the Working Classes, for their Social, Intellectual and Moral Improvement; Monday 16th October, 1837; by W. B. Hodgson; 8vo. Edinburgh, 1837; pp. 48.

Mr. W. Lectures with becoming dignity; his manner is very serious; his enunciations quite didactic; his logic not distinctly antiquated, being a sort of liberal induction. He takes permission, at page 6, "to assume—that education ought to aim at attaining the objects of existence, and that the objects of existence are the enjoyment and diffusion of happiness;" and, at p. 13, he lays down "the great principle—that no system of education is complete, which fails to communicate a connected view of science, that is, of the nature of man, and the objects with which he is surrounded in this world." At p. 14, he repeats his opinion, previously expressed regarding "the inefficacy of moral and religious training through the medium of the memory:" he had said at p. 7, "if we wish to excite the moral sentiments, we must not commit moral principles to memory, for these exercise merely the intellect which retain them, and leave the heart untouched; we must furnish them with their corresponding objects." On the same page he affirms that "mind consists of a number of various powers," and he views it as composed of the Propensities, Moral Sentiments, the Immaginate Powers, and the Intellectual Faculties: *all these,*" he adds, "must be comprehended in every perfect system of education." So say we explicitly; but we blame the lecturer for inconsistency in that he discourages education of the very highest

"moral sentiments," in that he abstains from making education in religion—in Revealed Religion—the foundation and paramount principle of his "perfect system."

He professes the phrenological philosophy: and this maintains the doctrine that the "*Supremacy of the Moral Sentiments*," in all mental exercise and government, is a distinct and eternal institution of the Supreme Creator. Now, the most exalted, from their being the most responsible, of all the "moral sentiments"—*of all the mental faculties*—are those which dispose man to worship a deity, to do justice, to practice mercy, and to hope for immortality. Wherefore, instructed by Phrenology, we do affirm, and are fully prepared to shew, that no system of education can be a "perfect system," unless it includes a predominant and special provision for educating the innate "moral sentiments," which intuitively and naturally dispose Man to be a religious Being, desirous of being led, through virtue, to the reception of everlasting happiness.

FINE ARTS.

MUSIC.—VOCAL.

A Funeral Anthem on the Death of the late Charles Wesley. By Samuel Wesley. London: J. A. Novello, 69, Dean-street, Soho.

We have yet to discover the proofs of Samuel Wesley's greatness as a composer. From what we have already seen of his works, we suspect that his pretensions have been greatly exaggerated by a certain party in this country, that through the trumpet-blasts of this party he has, in the present day, acquired a celebrity which posterity, far from raising, will considerably lower; and that, whatever may have been his merits as a performer on the organ, or even as a sound musician, he will never take his stand amongst the master-minds who have advanced the art by the invention of a new style, and by bringing new and untried resources to bear upon the latent emotions of the soul. His temporary celebrity we attribute rather to the exceeding dearth of talent among his contemporaries in this country than to any intrinsic greatness of mind; rather to the force of favourable circumstances, than to the possession of that power which controuls and overcomes the most adverse. An ordinary mortal, he lived amid a race of Lilliputians; what wonder, then, that these should regard him as the great "man mountain"

capable of performing wonders and (to them) impossibilities? It is this comparison with a low, an exceedingly low standard, that, for more than a century, has been the bane, as it has been the pride, of English musicians. They have rarely looked beyond their own limited sphere, rarely enlarged their minds by an extended survey of what was going on in other lands, and of the discoveries which were every day being made by those who infinitely surpassed them in research as well as in native power. To this unfortunate and narrow-minded tendency must we, in great measure, look for an explanation of the inferiority of our composers, since the time of Purcell, as compared with the bright luminaries who so thickly bestudded the musical firmament of our continental neighbours. The time was, indeed, when the works produced by our countrymen, instead of suffering by a comparison with those of the continent, received rather additional lustre from the juxtaposition. Witness, amongst others, the names of Tye, Tallis, Bird, Orlando Gibbons, and Henry Purcell, whose works, unfaded by time, still live, and ever will live, to attest their greatness, and to bear witness that in Music, as in other things, England may lift up her head amid her proudest rivals without a blush. We hope to see the time when she will again assert her equality, if not her superiority, and regain with honour the position she once so nobly held. The power, we doubt not, is present, and, once more directed into the proper channels, will manifest itself the more conspicuously from its temporary misdirection and inefficiency.

Of the anthem at the head of the present article but little need be said. It is the commonplace production of a commonplace mind; enlivened by no single spark of genius, it drags its weary length along; as it begins so it ends, in solemn unmitigated dullness. The only wonderful point about it is the ingenuity with which so many notes are strung together to so lamentably little purpose, and the extreme dexterity with which all feeling, all enthusiasm, is banished, in order to preserve the whole in unmeaning uniformity and frigid inanity.

INSTRUMENTAL.

Chefs d'Œuvres de Mozart, a new and correct edition of the pianoforte works (with and without accompaniments) of this celebrated composer. Edited by Cipriani Potter. Nos. 2, 3, 12, 13, and 14. London: Coventry and Hollier, 71, Dean-street, Soho.

THE republication of classical music by some of the first houses, and edited by eminent musicians, is a sign of the times which augurs well for the prospects of art in this country. The assertion that the English feel no enthusiasm for music, is contrary to fact: witness the time and money expended in the pursuit. But their efforts are too often wasted on trifles intrinsically incapable of yielding an adequate return of pleasure. It is a fallacy to regard bad taste as

something inherent in an individual, as forming a part of his nature; it were more correct to consider it as that partial and imperfect cultivation of the mental powers which is the necessary consequence of employing them upon the mean, the frivolous, and the insignificant. Men naturally take as their standard of excellence those productions of art with which they are acquainted; and, if informed of higher efforts, believe the evidence of their own senses in preference to the report of others. Hence, to lay before the public really good music is more conducive to the improvement of their taste than the most eloquent declamation. It were unreasonable, indeed, to expect that a solitary specimen of sublimity or beauty should suffice to counteract long-established usage and firmly-rooted tastes; but we have too much confidence in the powers of genius to doubt its capability of overcoming dulness, provided a fair field be allowed for the fight. Were it made the rule, instead of the exception, to place before the pupil classical music, as soon as she has acquired (by means of exercises) execution sufficient to prevent mechanical difficulties from interfering with the requisite attention to the meaning of the piece, then would bad taste become powerless by being confined to the few whose intellectual powers are unequal to the perception of beauty. And when we consider that the greatest masters, from the time of Sebastian Bach to the present day, have composed for the instrument most commonly learnt by amateurs, it seems, at first sight, incomprehensible that the majority should have neglected works akin to inspiration, and devoted themselves to the worship of mediocrity and commonplace. With the causes which have induced the preference of fourth and fifth-rate writers to those powerful minds who seem to have grasped the whole range of art, we have at present no concern. Suffice it that Bach, Handel, Haydn, Mozart, Beethoven, and Weber, who all attained their fame in the higher walks of the art, have condescended to write for that miniature orchestra, the piano-forte. So all-pervading, too, was their genius that their piano-forte works alone would have sufficed to rank them as the most inventive and original of composers.

Truly delightful, then, is it to find that Mozart, whom Dr. Crotch has justly termed the greatest of modern composers, has now a fair chance of receiving his due share of admiration from that numerous class, the piano-forte players of this country. It would seem that in England no composer can become generally known who does not favour us with his bodily presence. On other grounds it would be difficult to account for the neglect of Bach, Leo, Graun, &c., among church composers, and of Mozart as an instrumental writer. Had not his premature death prevented the fulfilment of his engagement to Salomon, his admirable flights of fancy would have been found on every piano. While, however, his cotemporaries, Dussek, Clementi, Steibelt, Pleyel, and Woelfl, all immeasurably his inferiors in creative power, though each possessing some excellence peculiar to himself, attained, during their respective life-

times, to the zenith of their popularity, the claims of Mozart as the originator of a new style for the piano-forte were totally neglected.

That Mozart was the true founder of modern piano-forte music will hardly be doubted by those acquainted with his works for that instrument, as well as with those of his predecessors and cotemporaries. Haydn's *adagios* might be taken for songs divested of their words, and his *allegros* partake largely of the character of his predecessors. He was no performer himself, and his sonatas exercised little more influence over the style of writing for the instrument than if they had been only adaptations from the orchestra. With regard to Clementi, who has been styled "the father of modern piano-forte music," a reference to dates will show that, at the time when he was yet a mere performer, Mozart had delighted the German public as well with the richness and novelty of his ideas as by the brilliancy of his execution. When Clementi came to England he was well acquainted with the compositions of Mozart, with whom he had often played in public. But if little direct benefit was derived from Mozart's piano-forte works, much was gained indirectly by their influence on those of other composers. Cramer, whom the English have long looked up to as the head of the *true* piano-forte school, adopted the great German as his model. We confess we are not of those who delight in setting up forms and modes in array against each other. We care not for the style, the manner, or the form, so long as genius, idea, or mind, is present; and if the eloquence of Mozart's soul-absorbing phrases cannot reason piano-forte players into the same way of thinking, then, indeed, may we despair of their taste. We despise while we pity the affected exclamation of the fashionable world, that Mozart is *passé*; and they need hardly be offended if we declare that with minds like his they never have felt sympathy. Fifty years ago they delighted in Pucitta and Von Esch; let them now applaud Herz and Donizetti.

To the daily increasing number of art's lovers we must, notwithstanding the brevity of our space, say a few words on the characteristics of Mozart's writings for the piano-forte. To the trite observation that "melody is the soul of music" we fully subscribe, although we feel inclined to differ from many who make the assertion as to what shall properly be called melody. Assuredly not the threadbare *motivi* of most modern composers, which owe their slender attractions to the jingling consonances afforded by the fundamental bass. Would you learn what melody is, ask of any great master, of Sebastian Bach, of Handel, of Mozart, of Beethoven; they will give you a better idea than any critical definition is capable of imparting. Suffer not yourselves to be misled by the notion that the ancient masters cultivated harmony at the expense of melody: such is the shallow conceit of those who, being incapable of comprehending their thoughts, endeavour to fasten on the composer the blame in reality attached to themselves. The florid counter-

point of the ecclesiastical composers is rich in melodies simultaneously progressing and leading to one common end; it has been reserved for modern times to produce graceful melodies which the accompaniment only serves to sustain and relieve. It is the combination of the two styles which constitutes the charm of Mozart's writing. He begins with a theme accompanied with the simplest harmonies, but his fertile fancy soon suggests other melodies fascinating as the first, with which they are artfully interwoven, and which lead him naturally and gracefully into the most distant keys. Now they are bedecked with all the luxuriance of modern ornament; now subside into choral-like gravity. Does any one thought seem to usurp precedence, others speedily assert their claim to admiration. Above all, whether he revels in chromatic intricacy, whether his mood be plaintive or joyous, he is ever easy, natural, and unconstrained. Every note bears the impress of flowing from the heart; nothing is laboured, nothing constrained.

Of the compositions before us, beautiful as they all are, our space only permits us to notice three. No. 2 in B♭ consists of a *largo*, an *allegro* and *andante*, and an *allegretto*, each excellent in their way; but the *andante*, with its mysterious modulations, is our favourite: the violin part (obligato) is admirable, and within the compass of a moderate performer. We know of no greater inducement for amateurs to cultivate this wonderful instrument than the enjoyment which, in domestic performance, they may give and receive by contributing their share to the production of these charming compositions. No. 3 is a fantasia and sonata, both in C minor, and in the sombre and plaintive style peculiar to their author. Familiar as we have long been with these compositions, every successive perusal developes new beauties. No. 14, a rondo in A, is a complete novelty to us; it is not to be found in our foreign edition (Simrock, at Bonn), and we believe it has never before been published. Sparkling, gay, and brilliant, it forms a striking contrast to the work just noticed, and serves still farther to illustrate the extraordinary versatility of the composer. The mechanical difficulties which it contains will easily be surmounted by any one who has played Cramer's studio.

We must now reluctantly conclude our notice, but not, however, without sincerely thanking the spirited publishers and the talented arranger for the pleasure they have afforded us. Messrs. Coventry and Hollier will be immortalised in the annals of musical art, by having dared to outstrip public opinion in the publication of Sebastian Bach's sublime organ studies. They have now increased their claims on our gratitude by presenting to the world, in an elegant form, the *chefs d'œuvres* of one of the greatest of piano-forte composers. That their efforts may be repaid by success, and that these enchanting works may find a place on every piano and resound in every drawing-room in the land, must be the sincere wish of all true friends of music.

A Studio for the Organ, exemplified in a series of exercises in the strict and free styles, intended as voluntaries for the use of organists. By Samuel Wesley. No. 1. London: D'Almaine & Co., Soho-square.

To call that a "studio for the organ" which any one capable of performing Bach's works for that instrument could play at first sight, is, to say the least of it, an amusing piece of self-conceit. Such, however, is the case with the present *Studio*, in which, if there is nothing for even an ordinary performer to study, there is still less for the scientific musician to admire. An introduction, consisting of passages exceedingly simple and not very new; and a fugue such as any one acquainted with the rules of composition might produce by the dozen without any remarkable stretch of thought, and as any one who has got over the first mechanical difficulties could play at sight: such is the composition of the first number of this studio by the "English Sebastian Bach." Unless what is to follow be infinitely more worthy of admiration and of study, how woefully have the public been deceived by those who have—we cannot conceive for what reason—endeavoured to raise the reputation of this composer so greatly above its just level!

Three Romances for the Piano-forte. Composed by William Sterndale Bennett.

Three Musical Sketches for the Piano-forte, entitled the Lake, the Mill-stream, and the Fountain. By the same. London: Coventry & Hollier.

These are the only works of this young composer that we have as yet seen, and they make us desire a further acquaintance with the products of his genius. The character of both is nearly the same—romantic and tasteful, perhaps even poetical, without any particular display either of originality or force of thought. Sketches, as a title, appears to us inappropriate. They are rather highly-polished miniatures, betraying something of labour in their composition, and hence, perhaps, wanting in that vigour and breadth of effect which should distinguish the sketches of the master. Miniatures or sketches, however, they are pleasing, and at the same time give promise of higher achievements.

L'art de la Fugue. Par Jean Sebastien Bach. A Paris: chez Richaut, Boulevard Poissonière.

We regret sincerely that it is out of our power to notice an English edition of this unique master-work, but none such, we shame to say it, exists. As a *practical* treatise on the art of fugue it is worth all the *theoretical* that ever were written, and contains finer specimens in this style than have ever been given to the world by any other composer. We cannot do better than describe it in For-

kel's words:—"This admirable work did not appear till after the author's death in 1752, but was, for the most part, engraved by one of his sons during his life-time. Marpung, then at the head of the musical writers in Germany, accompanied this edition with a preface, which contains many just observations on the utility of works of this kind. This work, however, was too high for the world in general; it was forced to withdraw into the narrow circle occupied by a few connoisseurs. It consists of variations, on a great scale. The intention of the author was to show clearly what can possibly be done with the theme of a fugue. The variations are all complete fugues upon the same theme, and are here called counterpoints. The last but one has three subjects, and in the third the composer discovers his name by BACH.* This fugue was, however, interrupted by the disorder in the author's eyes, and, as the operation did not succeed, was not finished. It is said to have been his intention to take in the last fugue four themes, to reverse them in all the four parts, and thus to close his great work. To make up for what is wanting to the last fugue, there is added to the end of the work the four-part choral,† Wenn wir in höchster Nöthen sind. Of the art displayed in this choral I will say nothing; but the expression of pious resignation and devotion in it has always affected me when I have played it: and I can hardly say which I would rather miss, this choral or the end of the last fugue."

We hope that our notice of this sublime work will induce some enterprising and patriotic publisher to bring out an edition of it, and to give English musicians an idea of what a fugue really is in the hands of a great master.

PROCEEDINGS OF SOCIETIES.

ST. JAMES'S ORNITHOLOGICAL SOCIETY.

THE first general meeting of this Society for the present session was held at the rooms of the Society, 57, Pall Mall; N. A. Vigors, Esq. M.P., in the chair. The minutes of the last meeting having been confirmed, the secretary proceeded to read the report, which was highly satisfactory and unanimously adopted. On the motion of Mr. Macleay, seconded by the Rev. John Jennings, Charles

* The note which with the Germans is called H, is the B of English notation.

† This choral is omitted in the French edition, and we have never been so fortunate as to see a copy of it. How much have we yet to learn of this mighty ruler of tones.

Lucien Bonaparte, Prince of Musignano, Mons. Temminck, and John James Audubon, were elected foreign members of the Society. Mr. Blyth having been called upon by the chairman, delivered a conversational lecture on the uses of certain peculiarities of structure, and premised his observations with the statement, that, having recently been engaged in a work on general Ornithology (now in a forward state), wherein he had disclosed some entirely new views on the mutual affinities of birds, founded upon the aggregates of their agreements and differences, in anatomical, as well as in external characters, he had necessarily examined very minutely the structure of the various types, in doing which he had observed several curious coincidences not hitherto remarked, which, in some instances, he thought had led to the solution of interesting problems in Ornithology. He would commence, however, by calling the attention of naturalists to an interesting particular which he had now for the first time noticed in the magnificent specimen of the Snowy Owl before him: he alluded to the presence of aigrettes, which were indeed so obvious that he was astonished that they had never previously been remarked. He was gratified, however, rather than surprised at detecting their presence, for it beautifully corroborated and confirmed the views which he had before entertained, and often expressed, regarding the systematical position of its genus. Mr. B. then proceeded to comment on a singularity of habit, rather than a peculiarity of structure, observed in the Motmot genus *(Prionites)*, with which all naturalists at all conversant with exotic Ornithology are familiar: he alluded to the unaccountable habit of self-mutilation practised by those birds, or the nibbling off of a small portion of the vanes of their two long middle tail-feathers, immediately beyond the extremities of the next pair, leaving, however, the tips barbed and untouched, as also the entire remainder of their plumage. Specimens were exhibited of the bird in moult, wherein the new feathers were entire, and others displaying more or less of the truncation of the web. Mr. B. offered an hypothesis in explanation, but pointed out a similarity of habit noticeable in an Indian group of Magpies—the *Dendrocitta* of Mr. Gould—to the discovery of which he was, curiously enough, led by remarking the resemblance, in general aspect and proportions, of the Motmots to the Cocindeus genus in question. This induced him to examine a specimen of the common *Dendrocitta vagabunda*, when he found, to his surprise, that, although the unserrated mandibles of the Pie were inadequate to cut through the web as was done by the Motmots, yet that the same feathers were so extremely worn by constant nibbling that they might be *read through* with the utmost facility, which was quite impossible in the other parts of the feather. A specimen was handed round. Mr. Blyth thought that co-observation of the two genera might possibly lead eventually to the discovery of the object of so very anomalous a practice. The protuberance on the beaks of the Hornbill constituted the next subject of consideration. After briefly describing its

elevation, and commenting on the singular exception formed by one species, wherein it attained a medium size, was quite solid, and consequently very weighty, Mr. B. called attention to the presence of eye-lashes in these birds, which, he stated, though of course analogous in use to those of quadrupeds, yet were different in structure, being nothing more than barbless feathers, which were developed and annually moulted like other feathers; and the same, he remarked, held true with the rictorial and supra-nasal vibrissæ of birds, as might easily be seen by examining their condition in a nestling. He affirmed that their presence was of extremely rare occurrence in the class *Aves*, existing only (so far as he was aware) in the *Strigidæ*, and in the Ostrich and Rena, besides two genera of Insessorial birds, the Buceros (or Hornbill, examples of numerous species of which were exhibited), and in the *Crotophagæ* (or Ani), a South American and West Indian genus, both of which, he remarked, possessed a protuberance on the ridge of the upper mandible. Now it was very clear that the purpose of eye-lashes was to defend the eye from falling particles of dust, &c.; and the only reason he could discern, therefore, why these two Insessorial genera should possess the structure in question, to the exclusion of all others, was that the rostral prominence must be employed for some purpose liable to detach such particles; whence he derived the conclusion that the excrescence was not merely ornamental, as some have supposed, but decidedly subservient to some definite object in the bird's economy. What, however, that use might be, must be left to observation to determine; and it would require, it was added, rather nice discrimination to discover what the intent might be of the various modifications of form which the protuberance underwent in different species. Mr. Blyth added a few remarks on the geographical distribution of the Hornbills, which were restricted to Asia, Africa, and the Oriental Archipelago, to which last-mentioned locality, he asserted, those with a large protuberance were principally confined; which circumstance had given rise to an ingenious *prima facie* suggestion by Mr. Mudie, in the article Buceros in Partington's *Cyclopædia of Natural History*, to the effect that, subsisting, as the members of this genus do, to a considerable extent, on fruit, and the luxuriant forests of those exuberantly fertile islands (the Indian Archipelago) being intertangled in a manner that those of Africa affords no parallel or even approach to, it might be that the prominence in the bills of these birds was designed to divide the flexible vegetation for them, so that they might see and reach those substances on which they feed, which is nearly the same conclusion to which Mr. B. had arrived on reflection upon the co-existence of the protuberance with eye-lashes.

Mr. Blyth remarked on the habit reported of the Ani (*Crotophaga*), to alight on the backs of cattle, and feed in the manner of the *Buphagæ*, as extremely remarkable as occurring in a genus inhabiting a locality where no large ruminants recently existed until introduced by Europeans. He then proceeded to call attention to the

gall-tufts of the Heron and Bittern groups, a tuft of unelastic cottony down, occupying their breast and flanks, the use of which, he believed, had never been explained, but which was sufficiently apparent on a little observation of the habits of the group. A Heron, he stated, might not uncommonly be seen standing, as far as the bare part of its tibia would allow, in water, and it would often strike at a passing fish at such a distance that none but those who had witnessed it could form an adequate conception of; in doing which the body, turning forward as upon a pivot, immersed the breast in water, whence, were the part in question to be bare, as usual in the feathered race, the water would, of course, come extremely cold upon the bird's chest; to prevent which Nature had bountifully provided it with a structure perfectly impervious to moisture, an example of which, taken from the breast of a Bittern, was handed round; and the lecturer remarked that beneath the skin were situate a number of peculiar glands, secreting a powdery substance, which was plentifully diffused over the plumage by merely shaking it, but more especially on the cottony down, which covered the site of its formation; and it was remarked that on rubbing the hand in this down, and then immersing it in water, the latter would roll off without wetting. The pectinated claw formed the next subject, which was treated of at considerable length, and shown, from actual observation, to be subservient to two purposes—one direct, the other, as it were, contingent, or merely arising from the circumstance of its possession. The former was the cleaning of the corners of the mouth (not vibrissæ) from Beetle claws or fish scales; the latter the cleansing of the plumage, to which the analogous but merely expanded and somewhat keen edge of the same claw in numerous other birds was likewise employed in effecting. The suggestion of Mr. Owen (in *Cycl. Anat. Physiol.*) was noticed, supposing that the parasites of those species which were furnished with pectinated claws might possibly possess superior powers of adhesion to those which infest other species. This subject was entered into at considerable detail, as involving a deeply interesting inquiry respecting the mutual relations of the preyer and the prey, the former of which were stated to be *particular*, the latter *general*. If, remarked Mr. B., we take a comprehensive survey of both kingdoms of organised nature as they now exist, it is unquestionably true that the nectar of the flower would appear to be designed, not only to furnish food for insects (which is, of course, a secondary and, as it were, contingent object), but primarily for the purpose of attracting them to settle (to which the glare of the corolla, and perhaps perfumery likewise, seem subservient), that by doing so, and traversing the blossom, they might unconsciously distribute the fertilizing pollen over the stigma; the benefit, in this instance, being clearly reciprocal. To advance another grade; certain other flowers, which do not absolutely require the assistance specified (as the *Antirrhinum*, or Snapdragon), have their blossoms closed against such extraneous interference; yet we perceive that Bees are, seem-

ingly in direct reference to these, provided with the means of *cutting through* these tubes. In this instance, therefore, the adaptation is as obviously not mutual; the structure of the flower displays no reference to the insect, whereas the insect is, consequently, expressly modified to rob the flower by violent means. Other instances were then brought forward, which led to the conclusion that just as we *ascend* (in this instance) to more particular cases, the relation of the prey to the preyer becomes more vague and general, while that of the preyer continues equally explicit; till at length we arrive at preyers such as the *Buphaga* (or Oxpecker), the entire adaptative structure of which appears to be expressly designed for clinging firmly to the hides of ungulate mammalians, while the beak is employed in penetrating to, and drawing forth, the larvæ of *Ostuda*, which infest them.

The parasites of all animals, it was contended, may be regarded, of course, as *preyers;* and consequently, in the degree of their speciality, the probability increases of their subsequent introduction to that of the species on which they occur; and, so far as I can judge (remarked Mr. B.), we have at present no reason to assume that species have ever been created in reference to future circumstances, however exquisitely, to the very utmost minutiæ, they unquestionably were to the actually existent: for most undoubtedly the ever-progressive changes in the condition of the earth are the appointed means of bringing about their successive extermination, when a new state of things having been gradually superinduced, their presence becomes no longer needed, new races being called into existence to supply their places, more appropriately adapted. Wherefore it was deduced, we may justly conclude that no species is provided with express means of ridding itself of its parasitic annoyances, although instruments that it may possess for quite another purpose may be likewise employed with that intent, of which the pectinated claws which had given rise to this course of argument afforded an example. An amusing speculation of M. Geoffroy St.-Hilaire was then referred to, on the philosophy of final causes, originating in the circumstance of a monstrous Calf, furnished with an additional jaw, situate at the extremity of the under jaw, and the grinders of which occupied its sides and were directed outwards, employing this anomalous structure with great dexterity as a cleaning instrument, insomuch that the exhibitors stated that it was provided with a pair of combs, skilfully combined and marvellously adapted for its use.

Mr. Blyth then launched out into the consideration of such objections as he supposed might be advanced in opposition to the foregoing course of argument, and particularly one to the effect that the adherence of Beetle claws and fish scales to the corners of the mouth was as much a future contingency as the being infested by parasites; which objection he did not conceive to be difficult to meet, as, admitting the axiom that every creature is perfectly adapted for its appointed mode of life and such contingencies as might be supposed to arise *necessarily* therefrom, the adaptation would, of course,

be less perfect than every analogy would lead us to pre-suppose, had they not the means of guarding against such contingencies; and as a specimen of the sort of contingencies which were provided against, he instanced the beautiful cleaning apparatus of the larvæ of the Glow-worm, a creature that subsists on viscid slimy snails.

With regard to Mr. Vigors's commentary on the use of the aigrettes of the Owl family, which was precisely that bold sort of generalization calculated to advance the *science* of Ornithology, Mr. B. was not prepared to acquiesce in that naturalist's views, and proceeded to point out some anomalies that led to the inference that aigrettes and ears had no mutual relation. He stated that a specimen of the Scops Owl, formerly in his possession, had the aigrettes extremely worn, even to the shaft, which, of course, led to the supposition that they were subservient to some use liable to rub them down. He did not, however, at all comprehend what that use might be. He was not in the least surprised that the often-repeated statement of the Ani settling on the backs of quadrupeds was erroneous, as comparison of its adaptive structure with that of of the Buphaga led to the same result. But as these genera had been appropriated, he would mention one particular wherein they agreed, which was the extreme rankness of their flesh, sufficiently perceptible on relaxing their preserved skins, the aroma arising from which was not only equally disagreeable, but exactly similar. Mr. B. subsequently remarked that Mr. Vigors's views of the purport of the caruncles of the Vultures, and also the analogous one of Mr. Bell on the facial membrane of the Horseshoe Bats, did not appear to him to be quite feasible, as he suspected that the senses of smelling and tasting required in every instance a wet or lubricated surface. He suggested this, however, with all deference to the opinion of those naturalists who thought differently.

Mr. Vigors, M.P., having congratulated the Society on the great accession of talent it had gained, alluded to the interesting observations which had been made by Mr. Blyth. He rejoiced that such a Society had been formed, as it would doubtless lead to inquiries highly interesting to ornithologists. Matters in themselves apparently trifling, had conduced to the illustration of great and important results. A hundred times he had found that a research after minor characters which were calculated to escape the eye of common observation, carried out truths highly interesting. The clump of feathers on the head of an Owl, the claw upon their feet, had led to serious investigations, pointing out the aim and end of the functions thus developed, and shewing their adaptations to the great objects of their Creator. The aigrette for instance, in the modification of the greater number of Owls, and the disk of the eye, are peculiarities assigned to them to direct them in their nocturnal researches for their prey. He then commented on the peculiar features of the Toucan and Caprimulgus group, and pointed out the great analogy that existed between raptorial birds and carnivorous quadrupeds. The Vulture preys by its scent, and is furnished with a

fleshy caruncle, which is subservient to its sense of scenting. The Falcon secures its prey by sight, and the organ of vision is accordingly powerful; the Owl by hearing, and that bird is equally remarkable for the complicated structure of its ear, to which the aigrette is designed to collect and confine the sound.

The Canine and Feline race of quadrupeds, Mr. Vigors remarked, also presented similar faculties by which they secured their prey. The next analogy alluded to, was that between the bills of the Snipes and Toucans, the former using it for probing the soft mud; and the latter likewise employing it for probing, but in a different manner. The majority of birds who were cohabitants with the Toucans in the South American Forests, had the elongated pensile nests, suspended from the extreme branches of trees, beyond the reach of Snakes and Monkeys. Nature had however appointed the Toucans to regulate their number, by providing them with a bill adapted for the purpose of inserting in those nests and dragging forth the eggs or callow young. Mr. Vigors then adverted at some length to Mr. Blyth's observations on the pectinated claws of birds, and concluded with an eulogium on that gentleman's valuable information, more particularly as regarded the connection between the eye-lashes and rostral-protuberance of the Hornbills and the *Crothophagæ*, and requested Mr. Macleay to communicate his own personal observations on the latter.

Mr. Macleay then rose and remarked it would be presumptuous in him, after the interesting discussion which had taken place, to add any observations. From his long residence in the West Indies, he had frequent opportunities of studying the habits of *Ani*: it was a bird extremely sensitive of cold, and does not live in captivity, even in that climate, unless kept by a fire; they usually congregated in considerable numbers, like the Tit, and thus obtained additional warmth. On dissecting the bird and closely examining the stomach, he found it contained a portion of animal food. He considered the eye-lashes protected the sight (in the manner stated by Mr. Blyth) when passing through the briars. He then called attention to a highly interesting fact, which he had lately discovered, and which furnished an exclusive definition to the great order of Insessores or Perching birds, allowed on all hands to be a natural group, but which had hitherto baffled the ingenuity of naturalists to define satisfactorily.

The character to which Mr. Macleay had alluded, was one common and peculiar to the Insessorial order, viz. that their young are hatched naked or callow.

Mr. Blyth again rose and stated, the same character had also occurred to him, as Mr. Yarrell and many other naturalists were aware, but he pointed out certain exceptions to exist, as the *Caprimulgidæ* on the one hand, among the Insessores and the Cormorants on the other, which were hatched quite naked, not being Insessores. In the first case, the reason that the *Caprimulgidæ* were excluded covered with down was sufficiently obvious, when we remember

that the birds were hatched on the bare ground without any preparation or nest, in consequence of which no care of the parent could suffice to prevent them from perishing, were they excluded otherwise. Mr. Vigors thought that the *Caprimulgidæ* scarcely constituted an exception at all, as they stood at the extreme limit of the Insessores.

A general meeting was held on Friday, December the 1st.; Harry Chester, Esq., in the chair. The report of the council announced that the Hon. W. T. T. Fiennes has most liberally offered to place in the custody of the Society during his life, at his own risk, the whole of his very valuable collection of birds; five hundred specimens, mounted in cases. The council had accepted this very liberal offer, and hope that this collection will shortly be exhibited in the rooms of the Society, where they cannot fail to prove highly valuable to the Society by furnishing it with the means of promoting efficiently many of its important objects.

Viscount Boyne, Thomas Barrett Lennard, Esq., the Rev. J. Jennings and F. B. Long, Esq. have been elected Members of this Society.

During the last month the council have not been able to obtain any new specimens for the collection of live birds in St. James's Park. Already, however, it contains a very valuable and full collection of British *Anatidæ*. The birds are generally in a healthy condition, and the extent of the water on which they are located enables them to be seen in a natural state; all the more ordinary *Anatidæ*, being already procured, the council are anxious to make exertions for obtaining an addition to their stock of rare and unique specimens, and trust that the support of the public will enable them to meet the expences necessary for the purpose.

Mr. Bartlett then made some observations respecting the two species of Gull, viz. the Glaucous Gull and the Iceland Gull, having recently obtained two specimens very much differing in size yet agreeing in every other particular. Mr. B. had in consequence been led to examine a great number of specimens, and found them vary from thirty-four inches in length to twenty-five inches with intermediate specimens, so that it was impossible in many instances to decide which was the Glaucous or Iceland Gull. This being the case, he was inclined to believe the whole of those specimens he had seen, to be Glaucous Gulls, and the bird named Iceland Gull, was in reality a small Glaucous Gull.

Mr. Blyth then proceeded to make some remarks on the close affinity of particular species of the Mealy Linnet, and at the conclusion the meeting adjourned to January 5th. The attendance was more numerous than on any former occasion, including Charles Lucien Bonaparte, Prince of Musignano, Dr. Horsefield and other distinguished naturalists.

LEICESTER LITERARY AND PHILOSOPHICAL SOCIETY.

We have always strongly advocated the importance of provincial scientific associations, as means highly calculated to diffuse more widely the advantages of knowledge, and also to bring to light and develop many a flower that might otherwise "blush unseen." It is, therefore, with the greatest pleasure that we record the establishment of any such institutions and report their success. The proceedings of the Leicester Literary and Philosophical Society, which has been very recently originated, are now for the first time laid before our readers, and the spirit and liberality with which this institution has hitherto been conducted we hope may stimulate other large towns to follow so excellent an example. The environs of Leicester abound in much that is interesting to the scientific inquirer. The insulated granitic and trap rocks of Charnwood Forest, with the vast marine and lacustrine deposits of the carboniferous series lying to the north and west of its anteclinal line, and comprising the extensive coal-fields of Coleorton, Snibson, and Ashby-de-la-Zouch, with the limestones of Ticknall and Breedon, present to the geologist a wide field, both for practical illustration and interesting conjectures. The botanist, too, will find an ample storehouse in the numerous varieties of flowers that adorn the broad meadows of the Soar, or bloom in wild luxuriance on the bolder ridges of Charnwood. The antiquary may find ground for extensive research in the many relics of times gone by, and the spots commemorated for some mighty deed achieved.

The Rev. A, Irvine, B.D., F.G.S., president of the Society, a gentleman to whose zeal and exertions the institution is indebted for much of its prosperity, delivered an Inaugural Address, the substance of which we are happy in being able to submit to our readers, as also some important information communicated by Mr. Lawrance, relative to fossil-remains of the tertiary and secondary formations. During the past session, several valuable papers have been read by Dr. Shaw, and we regret that our space will not now permit their insertion. An interesting lecture was also delivered by Mr. Wood, on Phrenology, and many other useful communications upon general science were furnished by different members of the institution. We hope frequently to notice the proceedings of the Leicester Literary and Philosophical Society, and wish it every success.

Inaugural Address, delivered to the Literary and Philosophical Society of Leicester, by the Rev. A Irvine, B.D., F.G.S., and President of the Society:—

It is a trite remark that man is naturally formed for society. Scarcely is it too much to say that all his powers, pleasures, and pursuits, are essentially connected with its interests. Living by himself, a solitary individual upon earth's wide surface, he would necessarily become 'a dumb and vile creature,' scarcely more intelligent than the beast of the field. I speak not of the first father of mankind, who

was a distinguished exception, having come perfect from his great Maker's hand, with his bodily form in the fulness of its strength, and his spirit radiant with divine intelligence; but I speak of a man reared from his birth in a lonely desert, though that desert were a paradise; and there is every reason to believe, from the nearest approaches made to such actual experience, that he would be little, if at all, superior to the Ourang-outang of the woods—a pitiable specimen of humanity.

If we turn to the consideration of such forms of society as have, at different periods, existed in the world, it is not a little remarkable that the first great scheme attempted after the flood, by a combination which then embraced the whole human race, was an absolute defiance of the Divine Majesty; for it was an effort to establish their union upon a solid basis, and record it on a lofty tower reaching to the height of the heavens, and defying the power of that Omnipotent Avenger who had destroyed the whole world by water. Their designs were impious, and impiety, in any social body, is ever the harbinger of evil; for it stands as a mark to the vengeance of that All-ruling Power whose laws it has broken, whose authority it has contemned, and who hath declared of the righteous man that "all that he doeth shall prosper; while the ungodly are not so, but are like the chaff which the wind driveth away."

But where the objects of any society are such as those which we profess to pursue, there is good reason to hope that "dew of heaven may fall thick in blessings on it." Those objects are legitimate and good which tend to extend our knowledge and strengthen our understanding, to refine the taste, and improve the heart; and wherever they have been steadily kept in view their pursuit has been generally crowned with success, a generous emulation being excited among the members, aiding one another in their different inquiries, eliciting observations by which mutual information is attained, each contributing his portion to the general fund, and thus accumulating intellectual treasures beyond their most sanguine hopes. Where such societies have sprung up, that region which was formerly as a desolate wilderness has been often seen to flourish like a fruitful field, civilization and refinement being fostered by the breath of genius, learning, and philosophy [as the president amply proves and illustrates by the happy results produced by the operations of the ancient Select Society of Edinburgh, the Royal Society of London, and the Geological Societies of the metropolis and country towns].

Fostered, and strengthened, and animated by mighty minds, Geology has extended her researches far and wide. Into that "reign of chaos and old night" she has urged her daring course, dragging forth to the light, from the secret recesses of remote ages, and from the dark bowels of the earth, the wrecks of former worlds, plants of unknown growth, with animals that have lived and moved in earth, in ocean, and in air, at periods beyond the reach of human calculation; all bearing with one unanimous voice this harmonious testimony—

"the hand that made us is divine." Hence have arisen interminable myriads of proofs of the wisdom, power, and goodness of the great Creator and Governor of the universe: and thus it is that, even from the remotest ages, every thing in Nature, when rightly interpreted, accords with the language of Revelation, impressing the mind with ever-new delight, in contemplating the wondrous works of Him who "made the heavens, and the earth, and the sea, and all that is therein:" If, then, there be any truth in the prediction, that the future progress in science will henceforth be effected by the joint operation of many, not by the towering genius of one, surely that conviction should incite every one of us to bring hither his voluntary contribution—to cast his small pebble on the hill of science—to supply one little drop to the ocean of its immensity.

It is with such a hope that I would now more particularly refer to the establishment of this Philosophical and Literary Society; and you will bear with me, I trust, while offering a few observations upon our own particular case, that we may thus not only have our minds cheered with the anticipation of many advantages likely to accrue, but may likewise be zealous in gaining proselytes to the cause of science, by communicating our views to others, striving to enlist them in the same pursuit, soliciting them to the delightful task of co-operating in the advancement of truth, and feeling, also, that the genuine philosophic spirit is ever that of the pure philanthropist. Knowledge, when imparted, is then only enjoyed, and enjoyed in proportion to the extent to which it is imparted.

The two principal advantages, then, are, *first*, the formation of a better taste in a town devoted chiefly to mechanical pursuits, little connected with either literature or philosophy in general; and *then*, the diffusion of a more friendly feeling among all classes and sects, who have, at present, no common bond of union, but are too much separated from each other, both by political and religious differences.

1. The formation of a literary taste, in a town so little accustomed to cultivate either literature or philosophy, strikes us at first sight as extremely difficult. But because it is difficult, let us not, therefore, despairingly regard it as impossible. "It would be easy," says Polybius, "to shew by instances, that many things, which appear in the beginning to be not only difficult but absolutely impracticable, are, in the course of time, and by continued use, accomplished with the greatest ease. Among numberless instances, the art of reading may be mentioned as one of the clearest and most convincing proofs of this remark. Take a man who has never learnt to read, but is otherwise a man of sense; set a child before him who *has* learned, and order him to read a passage in a book. It is certain that this man will be scarcely able to persuade himself that the child, as he reads, must consider distinctly, first, the form of all the letters; in the next place, their power; and thirdly, their connection with one another.

for each of these things requires a certain portion of time. When he hears him, therefore, read four or five lines together, without any hesitation and in a breath, he will find it very difficult to believe that the child never saw the book before. But if to the reading some gesture should also be added—if the child should attend to all the stops and observe all the breathings, rough and smooth, it will be absolutely impossible to convince the man that this is true. From hence, therefore, we may learn never to be deterred from any useful pursuit, by the seeming difficulties that attend it; but to endeavour rather to surmount those difficulties by practice and habit." The practical lesson thus suggested to us is of the very highest importance, and is calculated to inspire us with new confidence and vigour in the acquisition and cultivation of intellectual habits. A taste for refined mental exercises, even where it may not exist in the individual mind itself, may be powerfully influenced and strengthened by instruction, by imitation, by friendly intercourse, and by various other adventitious circumstances. Again, there are numberless minds in which the seeds of such taste, though abundantly sown, never germinate; partly through unconscious indifference, and partly also from a total want of opportunity to cultivate the habits by which it is to be matured, or of an attention entirely devoted to other occupations. Now, in instances such as these, much may be done to awaken those dormant powers, and to remove the obstacles which check their expansion. By an amicable collision of ideas between man and man it may be found possible to attract the attention of the man of uninformed mind to a new class of pleasures, to allure him into that track of observation and study which may terminate in the refinement of his taste, and enlargement of his views, and expansion of his understanding. Instances have frequently occurred of individuals in whom, even at an advanced period of life, this improvement has been wrought to a wonderful degree. In such men, what an immense accession is made to their best enjoyments! Awaking as if from a trance, they luxuriate in a new existence. Those intellectual objects which they had utterly disregarded now call forth the utmost energies of their mental powers, and they feel a double transport, while, looking back upon the blank region of the past, they partake of the present with as keen a relish as they anticipate with delight the distant and the future. Such are the high gratifications experienced by the man who, after having consumed in low occupations and grovelling amusements the prime of his days, is at length enabled to shake off the shackles with which he was bound, and walk forth in all the blissful sensation of a renewed existence.

As excursions into foreign climes animate the attention, excite the curiosity, and improve the taste of the traveller, so do these surveys of the regions of intellect spread a brightness and a beauty over the scene of our contracted duty and our daily toil. Without some such awakening cause, how many slumber on through the whole of life, and go down to the grave with faculties unimproved; having wasted

all those diviner powers which would have exalted them in the scale of thinking beings, and would have stored their minds with choicer treasures, and conferred upon them far higher happiness, than all that riches or grandeur can bestow. I speak not here of that portion of the humblest classes which is utterly devoid of education, with all its refinements; to them such enjoyments must necessarily be rare indeed, being, in general, far beyond their reach. They, therefore, indulge their appetites with avidity; and, unless impelled by the ennobling influence of pure religion, they seek no higher happiness. A remedy for such defects has been attempted by establishing, for the improvement and instruction of those whose situation in life has precluded them from the attainment of such advantages, Mechanics' Institutes; which, by a strict adherence to their object, under wise regulation and judicious management, can hardly fail of accomplishing their purpose, and conferring essential benefits upon an extensive class of the community. But I am now speaking of men destined for the higher and more independent walks of life, who are too often led, by ignorance of their own possible attainments, to cultivate only a small corner of the mental field, and to abandon, as an unprofitable waste, "by far the most valuable portion of that intellectual inheritance to which they were born." They thus lose all those expanded views of Nature and Nature's charms which, to the eye of the uninstructed, are wrapt in thickest darkness, but rise prominent and conspicuously beautiful to the view of him whose intellectual vision is "purged of its film," and who, by the aid of physical science, discerns, as it were, all the secret but perfect mechanism by which she produces such astonishing effects. Such was the heightened charm imparted to that most splendidly beautiful object in the inanimate world —the rainbow, by the new and clear comprehension of the Newtonian theory of light and colours, so exquisitely described by the most philosophical of poets, Akenside, as the result of his own personal experience.

From proofs, such as these, we may, therefore, fairly conclude, that whatever tends to diffuse these sun-beams of intellectual delight over our existence as a town, is a blessing, an inestimable blessing. And if such be the possible or rather probable effect of this Society upon its members, and upon all who come within the sphere of its influence,—if, by the endeavour to instruct others we improve ourselves,—if, by an amicable collision of opinion, we sharpen intellect or refine taste,—if we gain the valuable habit of contemplating, with patient care, any interesting object presented to our observation, and are enabled not only to view it in a philosophic light, but also to pourtray it in clear and faithful colours, we shall thus have acquired that which will give vigour to our conceptions, perspicuity to our language, and throw over the whole of life a polished grace and inexpressible charm. For we thus learn insensibly to view the objects whether of nature or art, with the eye of perfect intelligence, spontaneously though unconsciously, blending with what we see "all that

we know and all that we feel," incorporating all the beauties of external nature with the very essence of the soul, thus rendering the material world subsidiary to the spiritual, while it contributes to the power of the imagination and to the improvement of the heart.

Leicester, hitherto, has possessed no such advantages. It has, indeed, occasionally numbered some distinguished individuals among its inhabitants, but "few and far between." To associate with enlightened men is indeed a singular luxury. Never shall I forget the intense interest with which, for several years immediately before my coming to Leicester, I frequented the monthly assemblage of the Geological Society of London. In the midst of my laborious scholastic occupations, I hailed that meeting as a rest and refreshment, where I could for some hours enjoy the converse of men of enlarged and cultivated minds, and hear "their speech distilling as the dew," with thoughts calm and copious, bright and new as the fast-falling snows of winter, while elucidating subjects, dark indeed and impenetrable to inferior minds, but open as the day to their penetrating glance, and by them expanded also to the view of others, at the touch of their magic skill.

If here we can, even at a long distance, follow their steps, it will be a delightsome consummation. Heaven grant, that this our Society may become an honor, a blessing and a delight to all that frequent it! This fervent wish affords some better hope of accomplishment, now than heretofore, if you reflect upon the widely increasing prospects of a liberal education that have opened upon the town within the space of the last year. Two large Proprietary Schools have been projected, of which one is in process of erection, the other is already built, and flourishing beyond our most sanguine expectation. Doubtless these large establishments will not only send forth many young candidates for admission to our Society, richly imbued with classic lore and mathematical science, but one of them has already brought within our circle men eminent for their attainments both in literature and philosophy, two of whom, I rejoice to say, have already enrolled themselves amongst us, and will doubtless prove themselves most able and efficient members of our body. Under all these auspicious circumstances, are we not justified in hailing the approach of a far brighter day than has ever yet dawned upon us? or rather, may we not turn our hopes for the future into exultation at the past, and congratulate ourselves on the light of taste and intellect so recently diffused through this town and neighbourhood, by the Essays that have been read in this Society, and of which those that have been given to the public, have been welcomed with the warmest approbation.

2. The other peculiar benefit likely to be derived from the establishment of this Society, is the extension of a more friendly feeling among all classes and sects, who at present have no common bond of firm union, but are too much separated from each other both by political and religious differences. It is our happiness to live in a land,

where Civil and Religious Liberty sits triumphant on her throne. Long may that throne be established in wisdom and supported by prudence! Never may its foundation be subverted, or moderation, its best support, withdrawn! Never may it be levelled in the dust, either by the despotism of one, or the licentiousness of many! May it be lasting and immovable as our island itself, baffling the storms of faction, as Britain "*baffles with her hoar cliffs the loud sea-wave.*"

Allow me for a few moments more, to make an observation connected with the future welfare of our Society. In the term Philosophical, is legitimately denoted not only Moral but likewise Natural Philosophy, including also Natural History, which comprises some choice treasures that address themselves not to the ear, but to the eye. Do you then think that it is possible for us, by our combined energies, to form a collection of such treasures? The soil on which we daily tread is not quite devoid of minerals. Witness the beautiful mines of Gypsum, quite in our neighbourhood. The Coal-mines are near, and no stratum is richer in geological treasures than the carboniferous limestone. Barrow is also within a few miles; and we have abundant evidence, that there, in the olden time, have been "creeping things innumerable;" while that splendid antediluvian the Ichthyosaurus, has disported himself abundantly with his fellows, in the quiet waters which then surrounded it. Burrow Hill is also rich in stores of another stratum; and I might point out many other productive spots quite within our reach. But above all, our own beautiful Forest, modestly rearing, with primitive dignity, its granite-crowned head from the centre of the earth, abounds in geological interest; and I scarcely know a more exquisite luxury, than to inhale the healthful air, on a bright sunny day, while engaged in scientific research, on the summits of those breezy hills.

Shall we then begin a collection? That is the point which I would now earnestly press upon your attention. If you are convinced, that such a concentration of materials would be of no less ornament than use to our district, I would add with pleasure, that my own very limited collection of specimens, mineralogical and geological, shall be most cordially presented to this Society, in the hope that it may form a nucleus, round which a variety of interesting and more valuable stores may be collected. The gift will be really no sacrifice to me. For, I had immense pleasure in making the collection many years ago; but except the gratification of shewing its contents to an occasional friend, with me they are actually useless; and my imperative duties leave me so little time to attend to them, that their very names are fading from my memory. If you thus kindly accept them, and they should generate in any individual a love of inquiry, or stimulate research, I have my recompense.

There is only one other remark that I would add, namely, that if we would harmonize, refine and adorn our philosophy, particularly if we would successfully extend our researches to Botany, or some other departments of Natural History, we must pay our court to

the softer sex. Assistance has been often no less graciously afforded than thankfully received by most distinguished philosophers; nor is it presumptuous to hope, that it may in a similar manner, be kindly accorded to us, should we strive earnestly and faithfully to shew ourselves worthy of their protection. Should this eventually prove to be the fact, whilst we are ever ready, as individuals, gratefully to acknowledge the salutary influence which they shed over every condition of life, whether of prosperity or adversity, heightening all our joys, and soothing all our sorrows; as a Society, devoted to the contemplation of whatever is found to be interesting, excellent, or wonderful, throughout the regions of universal nature, we shall here tender our united homage of respectful admiration to "the fairest and best of all God's works."

A most interesting communication was made by Mr. Laurance upon some remarkable specimens of fossil fruits and plants, recently found in the coal formation of Lancashire. After a few preliminary observations, Mr. L. proceeded to describe the specimens which he said formed the most interesting illustrations of a delightful branch of the study of those extraordinary changes which the earth, its climate, its inhabitants, and productions have from time to time undergone at remote periods of its history. They tell a tale (he continued) of novel and astonishing import—a tale which, until these latter times, would have challenged universal incredulity—that the earth abounded with fruits—

> "Herb yielding seed,
> And fruit-tree yielding fruit after her kind,"

which man too fondly regards as created solely for his sustenance, a thousand ages ere he became its denizen—a tale told in language so unequivocal that it could not be mistaken. The whole mass of the earth, in fact, or at least that portion of it which comes under our observation, the outer crust of our planet, may be regarded as a vast *hortus siccus*, of which every stratum is a page. We drain a stagnant lake, and find in its bed, where the water had rested for ages, timber still rooted and undecayed. We excavate the peaty soil of fens, and turn up a venerable Oak, or nuts, or leaves, or acorns, or some other vestige of timber where no wood now adorns the surface of the country. The sea recedes, and exposes beneath its beach a sub-marine forest; or an extraordinary tide sweeps out an estuary, and from its sandy bed majestic trees thrust out their scathed arms, or exhibit their branchless trunks in the attitudes in which they vainly resisted the overwhelming element. Now we delve into a sandstone quarry, and our operations are impeded by the interposition of the silicous stem of some patriarch of the primeval woods—a gigantic Pine laid prostrate in the quarry; or perhaps, enclosed between the sandy laminæ, we discover some delicate specimen of its foliage, the anatomy of its leaves preserved and imprinted upon the unyielding stone with a precision and beauty which

the most skilful herbalist vainly attempts to imitate. Or, again, an incoherent cliff on the banks of the Medway, undermined by its action, has slid into the water, and behold! the face of the dissevered mass of clay is hung with clusters of fossil fruit, of which the celebrated *tertiary* beds of Sheppey are so prolific. The date of Africa, the cocoa-nut of the tropical islands, the bactris of America, the areca of Asia, and a hundred species of aromatic and other inter-tropical fruits are here seen with a semblance of reality which, like the celebrated painting of Protagoras, might invite the birds to taste. But we are about to penetrate into the dark recesses of the earth in search of Coal. Here is a vast homogeneous red rock, composed of minute atoms of silicious matter, closely compact, and almost crystalline, through which to pass: though deposited slowly and without violence, it has enclosed no relic of the vegetation the *flora* or the *sylva*, of an adjacent continent or island, from the waste of which its mass is derived. Here and there a group of vegetable forms is met with; but they are "few and far between," like oases in the sands of Egypt. The red sandstone is, indeed, a great Sahara in Geology—it is a blank in Nature's fossil Herbarium. Having traversed this, by a sudden transition we arrive at the coal formation—a mass of consolidated mud, vegetable *debris*, and oceanic land, of an extent and aggregate thickness which almost exceeds belief, yet throughout regular in its alternations, uniform in character, and rich in fossil treasures, every layer enclosing some relic, more or less perfect, of a vegetation to be sought now in more genial climes. Here our *herbarium* is truly *rich* indeed. Lastly, we visit the slate quarries, or the limestone rocks adjacent, which belong to the transition period in Geology; and here misshapen vegetable forms, to which the eye is not accustomed, attract attention and invite speculation. They are the *Algæ* and the *Fuci*—the vegetation of the "hoary deep."

"The dark illimitable ocean without bound,"

whose heated and turbid waters at this early period were replete with organized forms resembling those now existing in the equatorial seas. This is the last page in our *hortus siccus;* but the rapid glance we have taken of its contents will hardly suffice to render intelligible and interesting the facts which the specimens under review elucidate.

It is to three distinguished naturalists, pursuing simultaneously their labours in this novel domain of science in different countries, that we owe the rapid advancement of our knowledge on the subject of fossil Botany—Adolphe Brongniart in France, Count Steinberg in Germany, and Professor Lindley in England. Each succeeding publication of the respective authors embodies some fact unknown before, and exhibits occasionally some phenomenon at variance with the pre-existing theory, and upon minor points the authors sometimes differ in their conclusions: but this is a leading generalisa-

tion from their discoveries, in which they all agree, and which each succeeding fact tends to confirm—every specimen brought to light to illustrate; that a law, corresponding with that which characterizes the animal remains entombed in the earth, marking successive and distinct races adapted to the climate and condition of the earth at different geological epochs, prevails throughout the vegetable relics dispersed through the various strata of which its crust is composed. Not indeed that there is established a progressive development of organised forms in the vegetable kingdom, from simple to complex structure, from acotyledonous to monocotyledonous and dycotyledonous plants, from the humble Lichen to the lords of the forest—"a gradual perfection of organisation going on from the remotest period to the latest geological epoch," as M. Brongniart and others have contended—but simply this, that certain tribes of vegetables are found to characterise certain strata, either exclusively or in greater abundance than other strata, indicating the prevalence of those races on the spot at the period of the formation of the rock in which they are embedded. Moreover, and this is the result, singular though it be, which might have been anticipated from the discoveries of Cuvier in fossil Zoology, that the types of *the existing* vegetation are to be found only in the higher or more recent strata, and that in proportion as we recede from the newer to the older formations, the fossil vegetables assume less and less the form of existing species. But although numberless species, genera, and even whole tribes of plants, which have long since ceased to exist in any part of the world, are found in succession as we penetrate the earth, it must not be inferred from hence that monstrous and anomalous forms present themselves, with which the botanist is unable to grapple, exhibiting a departure from the laws manifest in the existing creation, disturbing the harmony and upsetting the order found to prevail in every department of Nature's works. Every specimen, however eccentric its species, however misshapen and uncouth its form, may be referred to some of the recognised families of the vegetable kingdom, although now, perhaps, for the first time exhumed from the depths of the earth, and ten thousand ages have elapsed since it saw the light of day which gave it life and luxuriance. As the traveller who circumnavigates the earth or explores lands hitherto untrodden by human feet, finds everywhere the same order of things, though under a different aspect; so the geologist, however deeply he may penetrate into the earth, discovers only new proofs of the uniformity of the laws pervading Nature. He turns over, in fact, only another leaf of the volume of the Great Author. Now, the specimens of fruit on the table, which have been disinterred from a sandstone quarry in Lancashire (near Bolton), are evidently very dissimilar to any production of the soil and climate of the district whence they were obtained, at the present day: but the most uninitiated will at first sight discover in them some resemblance to the fruits which he has seen imported from the West Indies or South America: and the first inference which he would na-

clearly drawn would be a correct one—namely, that in the environs of Elora palms once grew the fruits which her ships now bring from the tropics, although he may be unable to account for the circumstance. Thus our proposition is illustrated. There is, perhaps, nowhere existing upon the earth fruit of precisely similar species to those under review, and until within a very recent period they had never been seen in a fossil state: but Professor Lindley pronounces them at once to be the fruits of some species of Palm analogous to the Date. The species is probably extinct, but with such confidence is their family alliance recognised, that they become the basis of very important conclusions.

One of the proofs of the high temperature of the earth at the period of the formation of coal, was supposed to be the occurrence of this tropical plant among the vegetable relics which accompany it in such profusion: but this appears to have rested merely upon the assumption that two or three doubtful species of leaves belonged to the tribe of Palms. Indeed Brongniart entertained the opinion that no decided trace of the palm-tree had been discovered in this formation. Abundance of specimens of this class of vegetation, be it observed, are found in the strata of later periods. They pervade, indeed, all the rocks in greater or less number, from the ancient carboniferous series to the latest tertiary deposits. Like the Pelasgi in human history, you find them at the early periods *existing everywhere* but *springing* from *nowhere*. The discovery of these most interesting specimens will, it is supposed, clear away the obscurity in which their origin was involved, and this circumstance whilst it adds to their interest and value, illustrates in a curious manner the progress of science which had anticipated nature and stole a march upon discovery. It was so with another very remarkable order of fossil relics belonging to this period—the *tree* ferns, whose existence had been suspected and predicted long before it was established. When Lindley and Hutton published the first volume of their "Fossil Flora," "there had not been described a single genuine tree-fern-stem from the coal of any part of the world;" now the existence of three English species has been demonstrated.

Singular as it may appear, the analogy between the grouping of the existing vegetation of the earth and the dispersion of these inert organic ferns beneath its surface—between the geographical and geological distribution of plants is so obvious and striking that these conclusions, established by subsequent discoveries, were strictly within the limits and in accordance with the spirit of inductive science.

But to those unaccustomed to the reception of this species of evidence, the inference deduced from these fossil fruits will appear to be unsatisfactorily established, and the palm-groves of our hyperborean regions will not spring up without a considerable effort of the imagination. This tribe of plants, the *palmares* of botanists, none of which range more than thirty or forty degrees on each side of the equator (thirty-eight degrees in the southern and forty-three de-

grass in the northern hemisphere), and most of which flourish only within the tropics, is among the noblest and most splendid productions of the vegetable kingdom—early known and esteemed by the ancients its very name became synonymous with plenty and sustenance, and attaches still to the city of Zenobia, whilst the majesty of their form and the surpassing grandeur of their port, obtained in modern times from Linnæus the title of princes and patricians of the vegetable kingdom. A well-known palm of Ceylon (the Talipot) is described to be as big and as tall as a ship's mast, the leaves, some of which are capacious enough to shelter thirty or forty men, form a magnificent capital to the trunk, a stately column rising one hundred feet in height. Until the last year of its life it is said to bear no fruit, when, as if the perpetuation of its species appeared to be the end of its creation all the energies of the plant are developed in a crown of glorious flowers—succeeded by fruit, and the tree, as if exhausted by the effort, dies.

Again, the date-palm of Arabia and Upper Egypt, (Phœnix dactylifera from Phœnicia having produced the best dates, and dactylifera, from the group of dates bearing some resemblance to the shape of the hand,) to which our fossil fruit are allied—a tree of so much value to man that, Gibbon tells us, the Eastern poets have celebrated its 360 uses—has a woody stem, sometimes of considerable thickness and of great length, surmounted by enormous masses of foliage, and for 200 years will continue to bear fruit with the unabated vigour of maturity.

If this, then, were the character of the vegetation of the period of our coal formation—if the earth were then planted with the arborescous trunks, penetrated by the roots and shaded by the massy foliage of the remarkable trees, why, it may with propriety be asked, do we not produce better evidence of their existence, more substantial relics than these the most insignificant, and it might be inferred, the most perishable portions of their gigantic forms?

Were we to turn over the sands of the desert which now surrounds Palmyra, or dig into the alluvium of some neighbouring stream, we might reasonably expect to find many relics of the palm forest, which probably once embosomed that city, overthrown and buried by the tornado or borne down by the torrent. And, indeed, this is the sort of evidence of which we have abundance at the later geological epochs. But up to this moment no palm wood—no leaves, except the doubtful specimens before alluded to—and no other vestige of the palm tree has ever been discovered connected with the coal strata, except the interesting relics upon the table. We may naturally expect, however, that the progress of discovery will furnish us ere long, with more solid evidence, at present its absence is one of the puzzles which geology so often presents.

Now the mass of sandstone from which the fruit was extricated abounds in relics of the contemporary vegetation, vestiges of the most perishable living forms, converted into imperishable rock, their succulent stems now metamorphosed into an unyielding sandstone,

their delicate leaves and soft integument, once painted with verdure, now blackened and replaced with inflexible carbon. The specimens now submitted with one exception, are all common coal plants, but as no palm tree has escaped to tell the tale of their times, they may, although not related, prove useful allies to the fruit with which they were associates, and help to elucidate the obscure question of the origin of coal.

We have here then the *Calamites* (nodosus, I believe), a plant which from its universal prevalence may almost be said to characterize the coal-formation. Whether the coal-measures be sandstone or shale—that is to say whether the deposits be sand or mud the calamites is always present—sometimes standing upright, perhaps in the very mud from which it derived sustenance when living, in which case the stem is cylindrical, but general prostrate and flattened as in the specimens before us. It is usual to refer this plant to the living order Equiseta, and to identify it with the horse-tail of this country, and contrasting its superior size with that of its puny prototype, the horse-tail never exceeding half an inch whilst calamites fourteen inches in diameter have been discovered, it affords a striking illustration of the more-than-tropical luxuriance of the vegetation of the period to which it belongs.

The next specimen is a portion of a flattened and partly decorticated stem of the *lepidodendron*, a genus of extinct plants most remarkable, as constituting a link in the vegetable kingdom which in the existing creation is wanting. Although branched and furnished with bark it was not of the coniferous or fir tribe, having no woody axis The *lycopodiacæ* to which it is supposed to bear the greatest resemblance, luxuriates in a hot and humid climate, and hence the occurrence of these lends force to the inference suggested by the *calamites*—that these plants were produced under those conditions.

The other specimens are casts and portions of the stem of the sigillaria or tree ferns, about which there has been so much discussion between Professor Lindley and A. Brongniart. Suffice it to say, however, that they are most decisive proofs of an equatorial climate: and that the fossil specimens sometimes infinitely surpass in size their living types under the most favourable circumstances of humidity and climate.

The last is a very remarkable and novel specimen to which the title of *Halonia regularis* has been given, which I believe is all that can be said about it. An uninitiated eye would recognize in it some resemblance to the Cacti or Euphorbiæ of our hot-houses, but it has probably no precise counterpart in the flora of the present times.

There is also a specimen of a striated stem which corresponds with nothing hitherto described.

I could find no specimens of *stigmaria* so common in other districts—as in Derbyshire, for instance, where it is the predominating fossil, and where, singular as it may appear, this cactus-like plant furnishes, in some places, the chief material for the repair of the roads. Nor did I discover any traces of the foliage of ferns in which

other members of the coal-series are so prolific. The aluminous and ferruginous shales (the mud of the coal-formation) appear to have been more favourable to their conservation than the sandy deposits.

Now from these vegetable relics the associates and contemporaries of our fossil fruit (meagre as is the collection) do we not gather important information as to the state of things then existing on the surface of the earth! Is it possible to resist the cumulative evidence which we have here of the high temperature of the earth and the air at that early period in these latitudes?

It would be idle to assert that these enormous accumulations of vegetable *debris* extending over a surface of many hundred square miles, were floated into these northern regions by ocean-currents from their native soil and climate. Masses of timber and other relics borne upon the waves and wafted by the breezes of the Atlantic, will sometimes travel to a vast distance, and thus the productions of the West India islands have been known to reach our shores; but the relics under review are not of these vagrant character. The plants exhumed from the coal formation lived and died in the neighbourhood where they are buried. They flourished and perished (if immutable forms like these can be said *ever* to have perished) in their maturity, uprooted by the torrent and enclosed in the mud of a lake or estuary, or the sand of a sea, ere their fragile stems could decompose or the living fruit had time to germinate. And this process going on throughout a long succession of unaccounted ages (so long and so vast indeed that we are lost in the contemplation of the phenomena which constitute their chronology) produced among others the coal-formation, which alone is sometimes as in the locality to which these specimens belong, 2000 feet in thickness, whilst every member of the series is complete in its fossil character and identity.

Whether these enormous deposits were the effect of river-currents, and floods, and the quiet alternations of sea and land such as we witness in existing nature, or the effect of violent and hostile inroads of old ocean upon *terra firma*, we are not in possession of sufficient data to determine, but the active agency of water, "water everywhere," is manifest in these vast accumulations. The regularity of the strata has been sometimes disturbed by the ejection of molten rock from beneath, and occasionally, as in the instance of the coal-formation under consideration, the whole series has slid down perhaps a thousand feet, the base of the mass having been displaced by some disturbance below in what Sedgwick calls Pluto's kitchen, but to Neptune and his fraternity, the river gods, we owe exclusively the construction of our coal-fields. And yet how few of the spoils of either are discoverable! A single bed of shells, perhaps a few inches in thickness, or a solitary skeleton of a fish may be the only vestige of the watery domain throughout an extensive coal-field. The general absence of marine and fluviatile remains from this formation is indeed remarkable. We know that the water was not destitute of these organized beings, for at anterior, and subsequent

epochs it teemed with life. Some chemical condition unfavourable to their preservation must have operated in the earthy matter which enveloped them:—a strange condition indeed which permitted solid matter to be dissipated and not an atom of the soft and succulent vegetable to perish. The carbonate of lime of the shell—the phosphate of the skeleton—and even the silex of cercalia and grasses alike yielded to the solvent—the imperishable carbon alone survived. So with the fruits, the shelly envelope has vanished and the destructible portion remains. It may be, as has been imagined, that the succulent plants imbibed the conservative principle from the atmosphere, and there are many circumstances which favor the hypothesis that it was the *office* of the vegetation of that period to abstract from the atmosphere the excess of carbon, and thus whilst the air was being made respirable for man and the animal races who were in aftertimes to inhabit the earth, inexhaustible supplies of that invaluable treasure, coal, were laid up for *our* use in the latter ages of the world.

These, however, it is evident, are secrets of Nature's Laboratory which may never be revealed to us. Science may attempt to imitate, human ingenuity speculate in vain.

There is another circumstance to which I must briefly refer, viz.; the remarkable coincidence observable between the geological distribution of fossil plants and the geographical range of the existing vegetation—a result perhaps the most singular that has attended the study of this subject. It may be thus popularly illustrated, without going into details:—Suppose a traveller to journey from the equator to the polar regions of the earth, he might thus characterize the different scenes of vegetation which distant parallels of latitude, or, better, the isothermal zones would present. He is now under the tropics, surrounded by dense and interminable forests of gigantic evergreens and ever-blooming trees of a hundred species of Palm, Bamboos, Tree-ferns, and Bananas, beneath whose refreshing shade a thousand *Cacti* and *Euphorbiæ* bristle the earth, aromatic shrubs give out clouds of perfume, and high in air hangs the epiphitic Orchis, whilst Cable Canes, hundreds of feet in length, trail along the ground. But he leaves the torrid zone, and grassy meads succeed to tropical jungles; the forests of columnar branchless trees with leafy crowns peering almost to the clouds, and forming so remarkable a feature in the landscape of intertropical climes, diminish into shrubs and gradually disappear, whilst the picturesque forms of the Oak, the Elm, the Chesnut and the Pine—the forest-trees of Europe—now meet his eye. Corn and wine, instead of the bread-fruit and olive, supply his wants; and where the soil is saturated with humidity, instead of Bamboos and Canes, Grasses, Sedges, and Reeds prevail. The Tree-fern has dwindled into an insignificant herb, and other trees, whose foliage yields so delicious a shade beneath a tropical sun, by degrees become dwarfish shrubs and eventually puny herbs. The Orchis leaves its abode in the air, and clings to the soil for support. In higher latitudes the scene undergoes a

still greater change: not only is the luxuriant growth of the warmer regions no longer visible, but the number of species of plants is greatly diminished, until, arrived at the circum-polar regions, the only representatives of the glorious forests of the tropics are the Mosses which vegetate in the swamps, the Lichen which clings to the icy rocks, or the Protococci which discolours the eternal snows!

In the fossil world, the latter scenes have no counterpart, for Geology knows no icy period: but in every other particular the geologist recognizes an epitome of the phenomena which we have described. Beginning with the productions of the temperate climate of Europe, of our own country and times, we trace in succession their gradual disappearance with the animals which have browsed upon the pastures or roamed in the forests. We mark the first advent of the Palm-tree in these latitudes, or rather the last, for we are going up the stream of time; the herbaceous Ferns give place to the more noble tree, and ere we leave the tertiary rocks the Palm-tree is predominant. In the secondary rocks some new forms meet the eye: the Cycas connects the Palm with the Pine, and the Cactus tribes abound—here, indeed we may repose in imagination beneath umbrageous Palm-groves and Bananas, or grope our way through tropical jungles until we are lost in the dense forests of Sigillaria and Lepedodendra, or swamped among the gigantic Equiseta of the marshes of our coal-formation—the rankness and excessive luxuriance of whose vegetation distances all analogy drawn from the present productive powers of the earth!

And it is not through the medium of the imagination alone that this remarkable coincidence may be made palpable to the understanding. A numerical estimate of the relative proportions of prevailing species of plants at different geological epochs, compared with a similar computation of the relative number of species *existing* under similar circumstances (the same conditions of temperature and humidity being assumed), gives a result which approximates as nearly to the assumed hypothesis as can well be hoped for in the limited state of our knowledge. In reference, however, to this, it must not be forgotten that 50,000 *living* species of plants are recognised by botanists, whilst only 500 *fossil* species are at present known to geologists.

In contemplating the wonderful phenomena with which the subject and specimens before us are connected, it is hardly possible to resist the temptation to speculate upon the cause and the object of these apparent vagaries of Nature: for strange indeed—"stranger than fiction"—are the mighty secrets inscribed in her portentous volume. Perhaps all speculations as to the means employed in the production of these phenomena, may be vain; but the end accomplished is clear—so clear that it cannot be mistaken. Although these Palm-fruits grew when there was none to eat—although the earth was adorned with beauty when there was no eye to admire, and waste and desolation "joint empire ruled" through many an age whilst "Chaos umpire sat"—has not a great and noble end

been effected? Is there no connection between the triumphs of civilized man and the agency by which our fossil specimens were hermetically sealed up in the sandstone rock? Can we see our streets at midnight illumined with noon-day splendour—our seas traversed by ships in defiance of contrary winds—man outsoaring the eagle in his flight above the clouds, or moving on *terra firma* in cars fleeter than the wind—our comforts and our luxuries ministered to, and our energies multiplied in a thousand ways—and forget that it is to *Coal* we owe all this?

It may be a marvel to us that the earth should have required all this fashioning, and that such a long and elaborate process should have been necessary in the construction of our abode; but the consummate skill of the Great Architect who has so admirably adapted it to our use and convenience, we can never sufficiently admire.

MISCELLANEOUS COMMUNICATIONS.

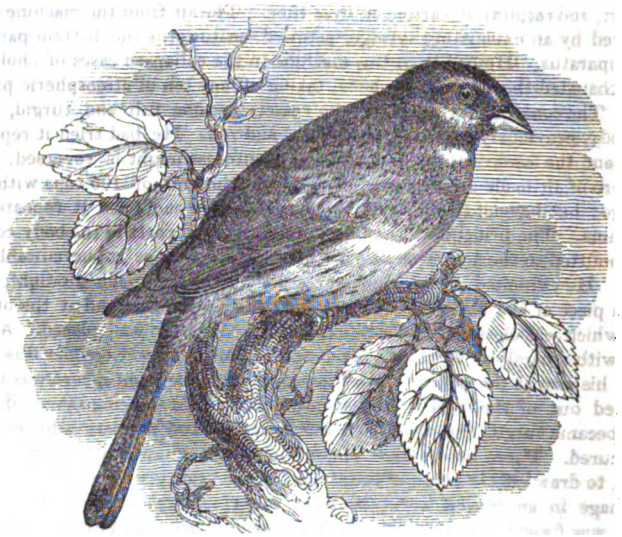
ACCOUNT OF SOME CRANIA FOUND IN THE ANCIENT MOUNDS OF NORTH AMERICA.—Whatever relates to the lost nations of North America is interesting. The fate of a people which occupied the richest part of that country, for an extent of more than a thousand miles, is involved in the deepest obscurity. Nothing remains of their history, and we can gather no ideas of what they were and what they did but from the constructions existing in the territories they inhabited. These works are numerous, and scattered over the country, from the lakes of Canada to the Gulf of Mexico. They consist of regular lines, having considerable elevations and great extent, of mounds or pyramidal eminences, and of spacious platforms of earth. These different works were adapted for fortifications, for places of worship, and for cemeteries. Within the last two years, reports had reached the Atlantic States of very extensive remains of structures, indicating the existence of one or more considerable cities in the territory of Onisconsin, formerly a north-west territory of the United States. The antiquity of some of the numerous works alluded to was great; there are circumstances which would lead one to refer them to a period eight hundred or a thousand years back. The circular and pyramidal eminences seem to have been destined for two purposes—for places of worship and for cemeteries. Some of them contain immense heaps of bones thrown together promiscuously, as after a bloody battle; in others the bodies are regularly arranged, and in some there are only one or two bodies: the bones in the last are usually accompanied by silver and copper ornaments, some of which are extremely well wrought. The crania found in these mounds differ from those of the existing Indians, from the Caucasian or European, and, in fact, from all existing nations, as far as they are known.

The forehead is broader and more elevated than in the North American Indian, less broad and elevated than in the European; the orbits are small and regular. The jaws sensibly prominent, less so, indeed, than in the Indian, more so than in the European. The palatine arch is of a rounded form, and its fossa less extensive than in the Indian or African, more than in the European, owing principally to a greater breadth of the palatine plate of the os palati. But the most remarkable appearance in these heads is, an irregular flatness on the occipital region, evidently produced by artificial means These peculiarities, with others more minute, give a character to these skulls not found in any living nations. Dr. Warren also stated that he had received other crania, which, at first view, he believed to be of the same race and nation, for they resembled them, in all their peculiarities, more nearly than one Caucasian head resembles another He exhibited drawings and a cast in proof of the exactness of this resemblance; but these latter, he observed, were species of ancient Peruvian heads. Now the cemeteries of the ancient Peruvians are distant from the Ohio mounds more than fifteen hundred miles; yet the facts stated above rendered it certain, in his opinon, that these nations were connected by blood, and rendered it probable that the northern race, being driven from their country by the ancestors of the existing race of North American Indians, retreated, after a long resistance, to South America, and gave origin to one of the nations which founded the Peruvian empire. Anatomy, also, he observed, showed that there was much resemblance between the crania spoken of and those of the modern Hindoos. And instruments, ornaments, and utensils, have been discovered in the mounds, which bear a great resemblance to articles of the same description seen in Hindostan. The facts stated above lead him to the following inferences:—1. The race whose remains are discovered in the mounds were different from the existing North American Indian; 2. The ancient race of the mounds is identical with the ancient Peruvian. To these conclusions might be added others tending to support existing opinions, but which are hypothetical:—1. That the ancient North American and the Peruvian nations were derived from the southern part of Asia; 2. That America was peopled from at least two different parts of Asia, the ancient Americans having been derived from the south, and the existing Indian race from the northern part of the same continent.—*Dr. Warren, British Association.*

Relative Size of the York and Birmingham Organs.—Can the Editors of *The Analyst*, or any of their correspondents, inform me positively which is the largest organ, that in York Minster, or the instrument in the Town Hall, Birmingham? I have heard both of these magnificent instruments, but am not myself capable of deciding the matter.—C. Blanchard, *Walsall, Nov.* 3, 1837. [Much nonsense has been circulated relative to the point forming the subject of the above query. We feel little inclined to add to the confusion already existing concerning these instruments. A question, in our estimation, of infinitely more moment, is the *quality* of the organs. In this respect we consider the Birmingham organ to be superior to its northern rival. We may add that the inhabitants of York and Birmingham respectively contend, with more vehemence than wisdom, for the supremacy of their own idol.—Ed.]

The Cirl Bunting.—The geographic range of the Cirl Bunting (*Emberiza cirlus*) extends to Asia Minor, where, according to Mr. Strickland, it

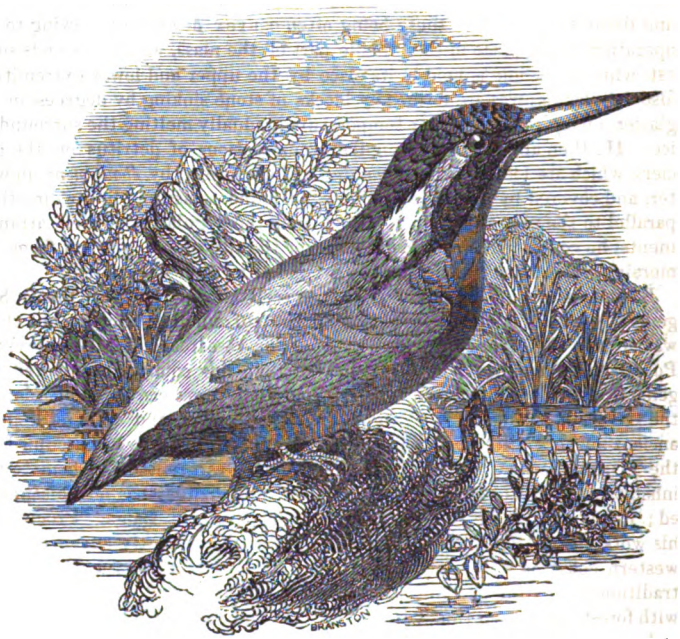
would seem to replace the yellow species, and to frequent the borders of streams and rivulets, which I have never observed it to do in this country. As before remarked, I have constantly found it to affect umbrageous Elms, evincing so marked a predilection for this particular tree that the species might have been named very appropriately the Elm Bunting. I have repeatedly met with it, indeed with several individuals, singing from the tops of a clump of Elms surrounding a farm-house, which, throughout the south of England, is a very likely situation to meet with it.



It is rarely noticed but within a few miles of the sea, and appears to be most abundant in certain districts of the Isle of Wight. Near Chichester, and again at Alton, it is not uncommon: and lately, while enjoying the view from the summit of Selborne Church, I noticed two of them singing in the vicar's garden beneath me, though the species was unnoticed by Gilbert White. Proceeding inland it rapidly disappears, and at Godalming is accounted a rare bird. Now and then a specimen is taken, mostly in winter, by the London bird-catchers, who seem to consider it a prize; but it can only be considered as a straggler near the metropolis. It is sparingly diffused over the greater part of Hampshire, and also, I should suspect, Dorsetshire; but I cannot speak from personal observation to the westward of Hants. It is popularly known in the Isle of Wight by the name "French Yellowhammer," and partially, both there and elsewhere, by the term "Blackthroated Yellowhammer," which are the only provincial epithets I have heard applied to it. The young appear to be extremely hardy; for, during a pedestrian tour, I carried one in a box in my coat-pocket for several days, feeding it on what various fare I could pick up by the way. This bird is now alive and healthy. I captured it near Yarmouth in the Isle of Wight.—*Naturalist for October, No. XIII.*

APPARATUS FOR WITHDRAWING ATMOSPHERIC PRESSURE.—Sir James Murray, of Dublin, has invented an apparatus for the purpose of withdrawing atmospheric pressure, partially or wholly, from the surface of the body. The first of his machines was for the whole body, and resembled, in form, a slipper bath, with the addition of a separate part to cover the upper portion of the body, the head only being free. The upper portion was luted to the lower by means of a composition (used in making printer's rollers for inking the types), and fixed in a groove; and, if necessary, the patient's face and head could be contained in a glass case, luted to the machine in the same manner, and respiration carried on by a tube. The air from the machine was removed by an exhausting syringe, screwed on towards the bottom part of this apparatus. He had tried this machine in the collapsed cases of cholera, and exhausted the air from the body, taking off one ton of atmospheric pressure. The consequence was, that the vessels became full and turgid, and the body, previously shrunk, was rounded and red. He had tried it repeatedly, and the same results followed. The process might be reversed, and pressure of air made on the body, even to the amount of 100 tons without damage; but beyond this it would not be safe. He had tried it repeatedly in asthma. The principle was applicable locally, and parts of the body could be submitted to the action of the machine modified so as to be suitable to them. He exhibited a contrivance of a long tin tube, made air-tight, and with a piece of wet bladder round one end, which was open, and at the other end, which was closed up, a small exhausting air-pump was placed. A patient with a paralytic wrist, put his arm into this; the wet bladder was tied round his arm at the top, to make it air-tight, and the atmosphere was then pumped out of the tube. The atmospheric pressure being taken off, the limb became turgid, the circulation was increased, and the part affected was soon cured. There was another adaptation of the same contrivance to the limbs, to draw off the effect of congestion of the brain; and one to stop hæmorrhage in an injured hand, limb, or other extremity. An exhausting pump was fixed to the end of a bladder, the limb was put into the bladder, and the neck then tied round to make it air-tight. The air was then completely exhausted by means of the pump, which compressed the bladder so close to the skin as effectually to stop even the pores of the skin. The same contrivance of a bladder and exhausting pump was also applied for the cure of ulcerated legs, by preventing evaporation of the blood by exhausting the air and making the collapsed bladder adhere tightly all round. For irregular surfaces he thought the instruments of particular value, since no dry-cupping could be used there. If this plan had been known when those melancholy deaths from dissection cuts took place in Dublin, and dry-cupping could not be had recourse to, it would have been fortunate. The machine would be particularly advantageous in withdrawing blood from particular parts to others more remote. Thus, in cases of congestion of the blood in the head, when bleeding had been carried to such an extent that it would not be safe to carry it further, owing to the great general loss in the circulation, blood might be made to accumulate in other parts, as in the legs. The case of a well-known brewer in Dublin was treated on this principle, and he recovered. Sir James has enumerated the kinds of cases where the apparatus might be used; asthma, defective external circulation, aneurism, tumors, and paralysis.

THE COMMON KINGFISHER (*Alcedo ispida*, Linn.).—We have never yet seen a good figure of this bird, and trust that the engraving we now present —executed by an eminent artist—may be considered a faithful representation. All the other figures we have seen of it err in the too great bulkiness of the body; for, although a thick bird, it is not so dumpy as ornithological draughtsmen would have us believe.



A very general opinion prevails as to the scarcity of the Kingfisher in England. This, however, is owing to the shy nature of the bird, and to the small attention paid to Natural History by the majority of our countrymen. The assertion of some, that it is extremely common, is, on the other hand, equally erroneous. The fact is, that it is equally, but rather sparingly, distributed throughout the country, that it may, perhaps, not often be noticed, save by the observing ornithologist. That a bird equalling in the splendour of its plumage the brightest ornithological gems of tropical climes should be indigenous in our comparatively northern regions, is certainly not a little remarkable. The majority of British birds, as almost every one knows, are plainly attired; but the plumage of many of them is, nevertheless, extremely handsome.—*The Naturalist*, vol. ii., p. 386–7.

MECHANISM OF THE MOTION OF GLACIERS.—Mr. Mallet, at the British Association, made it evident that many phenomena of these singular masses had been hitherto overlooked; and, although described by many eminent observers, no solution had been given to the question of their movement but that of their weight, which he showed could have only a partial

operation, as they often rest on rugged beds, and these not always of much inclination. He proposed a very ingenious explanation of their movement by means of hydrostatic pressure, arising from the fact of the lower part of the glacier being of a higher temperature than the upper: this causes a melting of the under part, and a consequent raising of the mass in a perpendicular direction to the earth's surface, while its descent was at right angles to the inclined surface: a progressive motion downwards ensues, following the law of the resolution of forces. He then spoke of certain causes of the rents and fissures in glaciers, these being often convex downwards, owing to the operation taking place in the middle part of the mass, which descends soonest, while the whole is held in its place by the upper and lower extremities: also tubular fissures are formed by blocks of stone sinking by degrees in the glacier, owing to their higher temperature gradually melting the surrounding ice. He then alluded to the singular accumulations of detritus on the glaciers, which are locally termed *moraine*, and are formed by *éboulements* in winter, and covered by the snow. These he found to assume linear directions parallel to the axis of the glacier; and, from the regularity of their arrangements, he conceived it possible to discover the site of old glaciers from the moraine which had remained on the ground after their destruction.

ENCROACHMENTS OF THE SEA.—It is well known that the Baltic Sea, generally speaking, makes inroads upon the surrounding shores; but there was an idea that Prussia resisted these. The researches of M. Domeyko, a Polish gentleman, have, however, proved that this country has shared the general fate to such an extent as to lose a whole province on the borders of the Gulph of Konigsberg. Voight, a German writer, and other still more ancient authors, all record that, at the time when Prussia was occupied by the Teutonic order, the province of Vitlandia was granted by them to the inhabitants of Lubeck. But every trace of this territory has now disappeared; it was situated between Billau, Brandebourg, and Balga. Pisanski, in his work on the Baltic Sea, says that the waters constantly advance on the western coast, as well as on the northern coast of Samland; and there is a tradition among the people that some long strips of land, formerly covered with forest, have been thus buried. In fact, the waves still throw up trunks and roots of trees which evidently came from their own soil, now at the bottom of the sea. The ruins of the chapel of Saint Adalbert, formerly six miles from the sea, are now scarcely one hundred paces distant.

GEOLOGY.—M. Tournet has presented a long memoir to the French Academy of Sciences, containing his geological observations in the neighbourhood of Arbresle; in these he establishes some well-determined affinities between the nature of those rocks which are known to have pierced through the upper crusts at various periods, as well as their direction, the soil which covered them, and their degree of fusibility, as connected with the period of eruption. M. Tournet thinks that the true and only primordial sedimentary rock is composed of clay slate, and that this rock, which contains the element of mica, being altered or modified in different manners, has been transformed into gneiss, mica slate, and other substances. He admits four modes of alteration: one is calcination, a second trituration, a third the changes produced by penetration and *cementation*, and the fourth is the influence of the granite, which transforms it into gneiss by introducing its feldspath when in a state of fusion.

Vegetable Physiology.—Mr. Nevan, in February, 1836, instituted some experiments on the physiology of vegetables: they were performed on Elm trees, forty years of age; and the results were the following:—1. The stem of the tree was denuded, in a circle, of its cortical integument alone, leaving the alburnum beneath uninjured. In the May following, the denuded part was filled up by the exudation of bark and wood from the upper surface of the wound, and the tree had not suffered in growth.—2. The bark and *cambium* were removed in the same manner. In August, 1837, this tree sickened, and there was no formation of wood or bark in the wounded part. Two developments, however, took place, one above the other, from below; the former having the appearance of roots, the latter were branches with leaves.—3. The bark and two layers of alburnum were cut away. The tree was at the time unhealthy: it, however, put forth its leaves in that and the ensuing spring, but shortly after died. No sap was observed above or below the wounded part. Roots were developed from the upper, and branches from the lower part of the section.—4. The bark and six layers of alburnum were taken off. The tree became much less vigorous, but did not die, and otherwise presented the same appearance as the last.—5. The bark and twelve layers of alburnum were stripped. The consequences were similar to the last two; the alburnum above and below the cut being dry: but an accidental cut that penetrated into the heart-wood exuded sap.—6. This was a repetition of the experiment of Palisot de Beauvais, by cutting away a circular ring of bark around a single branch. The branch continued to grow, and roots sprouted from the under surface of the isolated bark and branch.—7. In this the whole of the wood of the tree was cut away, except four pillars, composed of bark and sap-wood. In this case, the sap first appeared from above, descending by the pith, and then from the heart-wood the alburnum being dry. In this case the sap must have passed up the alburnum, and horizontally through to the heart-wood.—Mr. Nevan inferred from these experiments, 1. That the life of the tree does not depend on the liber or cambium, the inner bark or nutritive fluid.—2. A descent of sap takes place before the development of leaves.—3. That new matter arises from below, which had not previously been allowed. He thought there were two distinct principles in the tree; one the ascending or leaf principle, the other the descending or root principle. He had also performed some experiments on the conversion of roots into branches, and came to the conclusion that buds or branches might be developed from any part of the root above its extreme end, from which point it was impossible for buds to be developed.

Fossil Remains.—M. Azéma has found some fossil bones of Mastodons and the Rhinoceros, reptiles, and some well-preserved fruits, in the parish of Sauveterre, near the district explored by M. Lartet, whose discoveries we announced some time back. It would be interesting to ascertain whether the skeleton of the new and remarkable Rhinoceros brought from behind the Cape, by the expedition under Dr. Andrew Smith, presents more affinity to the recent or to the fossil species. It seems that the new fact concerning fossil quadrumana has been succeeded by a similar discovery in the Himmalaya mountains, but which is not so curious as the circumstance of finding these animals in Europe; and what is still more extraordinary, the comparative anatomists have determined that European species to be similar to those

Gibbons which inhabit the remotest parts of Asia. M. Lartet's discoveries have given rise to much discussion in the French Academy of Sciences, the members of which body do not assign all the remains sent to them to Quadrumana, but ascribe some of them to Carnivora and Pachydermata. Among other questions, it has been debated whether or not the Gibraltar Monkeys are indigenous to that rock, or whether they are brought by sailors from Africa and then let loose. It would be a remarkable proof of inattention, if, after so many years possession, the English could not solve this problem.

Sea Grape.—M. Arago, having expressed a desire for further information respecting the place whence the floating banks of sea-weed, seen off the Azores, originally came, M. Bonnet communicates his observations, all of which tend to the opinion that this weed, which is called the Sea Grape, and is supposed to have been brought by a current from the Bahamas, grows in the place where it is found. He says that, when becalmed and the water has been clear, he has seen detached pieces rise from the bottom in a fresh condition, which may be easily distinguished from those which have been some time on the surface: and M. Bonnet is convinced that, with proper materials, the bottom of this part of the ocean might be reached. This gentleman states that, in one of his voyages, when in 23° 26′ north latitude, and 44° west longitude, the water became quite muddy, and formed a turbid line north-east and south-west, which was half-a-mile broad.

Analysis of Methods for Determining the Functions of the Brain.—What are the functions of the brain? The object of the present inquiry is to analyze the several methods tried for the solution of this problem, and to pass a judgment on each. The first method employed was the anatomical: the brain was dissected and its structure examined, in order to determine its functions. But the mere anatomical examination of an organ in the body is inadequate to reveal to us its functions or uses. We may thus acquire a knowledge of its component parts, or some insight into its structure; but something more than merely dissecting the dead is required before we can divine the uses of any part in the living: suffice it to say, that dissection *has not* revealed to us the functions of the brain. This organ is every day dissected; its functions are still a matter of dispute. Some other method of investigation, then, was necessary, and another was tried, which might still be looked upon as an anatomical mathod; but in this instance the dissection was performed on the brain in the living animal, and hence may be denominated the method by vivisection; this was a step in advance. The effect of injury or removal of certain parts of the brain was compared with the influence thus excercised on the manifestation of function. When a part was cut out, its function could no longer be exercised; and it was agreed that by removing each part in succession the use of each would be discovered. This sounded speciously enough; but the results have demonstrated it to be wholly inadequate. To be able to remove each part separately, we should first know what these parts were; and, then, was it possible to remove one part of the brain without injury to any other part, or such a shock to the whole system as must materially derange every manifestation of function? Besides this method could throw no light on the uses of those parts of the brain which are peculiar to man, and therefore the most interesting and important; but which, not being present in the lower animals, could not be made the subject of such experiments. Accordingly,

we find, that such experimenters not only disagree among themselves, but different experiments performed by the same physiologist contradict each other. Some of the more particular points which have been thus attempted to be established are a relation between injuries of certain deep-seated cerebral parts, and the disturbance of equilibrium in muscular motion. Thus Fodera found that removal of part of the cerebellum was followed by motion *backwards*, but removal of the whole cerebellum caused the total disappearance of the power of motion. Magendie, however, found that a duck deprived of its whole cerebellum could still swim, but only backwards; while division of one crus of the cerebellum in an animal, was attended by the curious phænomenon of a constant rotatory motion of the body on its axis towards the side wounded. Flourens, who was one of the earliest investigators in this line, details many such experiments, and acknowledges a very curious and unexpected result, which, in fact, at once exposes the liability to fallacy in attempting to draw conclusions from such experiments. He found that division of the semicircular canals in the ears of birds (or rather the membranes lining these canals) was followed by abnormal motions, resembling those consequent on dividing certain of the deeper seated parts of the brain; so that the conclusion was irresistible, that these canals had the same right to be regarded as regulators of muscular motions as any parts of the brain, a conclusion obviously absurd, and which could not have followed had the method of investigation been correct. Bouillaud, in instituting experiments of this description, has devoted a particular series to investigating the functions of the anterior lobes of the brain, and although the result at which he has arrived is too vague and general to advance our knowledge much, still it is so far satisfactory as to lead to something like a determinate result, and one that is in accordance with results obtained by other modes of investigation. According to Bouillaud, ablation of the anterior part of the brain was always attended by a state resembling idiotcy, the power of discriminating external objects being totally lost, although the faculties of sensation seemed still to exist; and hence the conclusion that the anterior part of the brain is the seat of the several intellectual faculties. Bouillaud was so far fortunate in this experiment, that in removing the anterior lobe of the brain he separated a part which possesses a distinction of function;—but how vague the information imparted—no attempt to locate a single one of "the several intellectual functions," the seat of all of which is placed in this anterior part. Such attempt, however, must have been vain by such a method, and the amount of information obtained by vivisection must after all be allowed to be but small indeed. Accidents occurring in the human subject, occasionally afford a rude specimen of the result of such method as applied to investigating the functions of the brain in man—but here the result is not only curious, but somewhat startling; for the loss of large portions of brain from the anterior lobes is recorded to have occurred without any disturbance of the intellectual powers. Some remarkable cases, indeed, of injury of the brain are on record, which at present appear inexplicable upon any view of the subject, for they would go, not only to disprove the uses of particular parts of the brain, but the utility of brains at all; but in thus proving too much, they obviously prove nothing. Farther and more careful observations are necessary; in particular, attention should be directed to ascertain whether both hemispheres of the brain be alike injured, as we know that one side

is able to carry on its functions independently of the other. The inadequacy of the vivisecting method being thus made manifest, we turn to consider another and more popular mode of inquiry among medical men, and that is the pathological method, or rather the study of morbid anatomy as regards the brain. The pathologist considered that by watching the effects of disease as well as injury, and awaiting the result, he would meet with a sufficient number of cases in which particular parts of the brain were diseased, and hence their functions deranged, to be able to tell, by comparing the symptoms during life with the morbid appearances after death, what relation subsisted between the several parts and the functions exercised by those parts. But here again we are met by difficulties somewhat analogous to those which we have seen beset and embarrass the mode of investigation by ablation of parts. There is perhaps a greater chance that morbid action would be set up in one part of the brain, and be confined thereto, than that we should light upon a single organ in our attempts to cut out parts separately, and succeed in removing that part singly, neither more nor less: but how seldom in disease have we its ravages so strictly confined, or an absence of general or sympathetic disturbance involving neighbouring or distant parts more or less. Again, it must depend on the nature of the morbid action, whether the function, even when disturbed, be exalted, diminished, or altogether suppressed; while how difficult is it to determine respecting any individual labouring under severe illness, especially disease of the brain, to what degree any of his mental or moral powers be affected beyond the information to be obtained from his giving rational answers or not, to a few common-place questions. Morbid anatomy is useful in prosecuting the enquiry now proposed, it like everything else, has its proper time and place. Some light had, however, been thrown on these subjects by pathological investigation; and the continued prosecution of the inquiry, with due precaution, would doubtless add still farther to our knowledge. On reviewing, however, what had been as yet actually done by pathology in the way of connecting derangement of function with disorder of particular parts of the brain, but two points seem to have been with any certainty established; and these were the relation between loss of power of utterance and an alteration of the anterior lobules of the hemispheres, and between derangements of the generative system and alteration of one of the lobes of the cerebellum. These statements were originally made by a French author of note. Other relations were said to exist between affections of the extremities, upper or lower, and some of the deeper-seated parts of the brain; but these had nothing to do with the higher functions attributed to the brain, and which he was more particularly considering; while even these relations between the parts alluded to were contradictory of the result obtained by those who experimented on the same parts in living animals. As yet, then, it did not appear that much light had been thrown on the subject by pathological inquires. The two conclusions pointed out, however, were in accordance with the result of observation made by an altogether different method, and, as far as they went, corroborated the existence and situation of the organs of language and amativeness. New facts of course would be thus made out, but as being in itself an adequate method for discovering the functions of the brain, doubts might reasonably be entertained of the efficiency of mere morbid anatomy.

Another set of inquirers now entered the field, who, seeing the disadvantages of attempting to investigate the functions of the brain, by examining that organ in an unnatural or unhealthy condition, proposed to investigate it only in its healthy and natural state; and, by considering its developement, to determine its functions. Perhaps this may be denominated the physiological method; or that, which, by comparisons regarding the size of the organ in man and other animals, sought thus to determine in what man's intellectual superiority consisted. "Man has absolutely the largest brain of any animal in creation, and hence man's intellect is superior." This was a plausible dogma, and had the support of some great names, and much apparent truth; but, unfortunately for those supporting this opinion, it did not prove to be absolutely true, and so, necessarily fell to the ground. Man, in fact, has not the largest brain of all animals—the brain of the elephant and whale being larger;—hence man's superiority to these animals consisted not in the superior size of the brain: well, said others, we see this, and give up that test; but, though man's brain be not absolutely the largest, it is surely the largest in proportion to his body—and this is the reason of his superior intelligence. But this test was less fortunate than the former; for the wren, the sparrow, the canary, and many monkeys, have been found to possess brains larger, in proportion to the size of their bodies, than man; but it has not been proved, though each may be clever enough in his way, that any of them surpass man in intelligence. This mode of comparison not answering, the brain was next compared in size to the spinal marrow, and man was said to surpass in intellect, because in him the brain exceeded the spinal marrow more than in any other animal. Sommering, in particular, supported this opinion, but it is not tenable as matter of fact; there are exceptions, and Cuvier points out the dolphin as one.

The next mode of comparison adopted, was that of comparing the brain with the size of the bones of the face. The larger the brain was in comparison to the face, the greater would be the intellectual power; and hence the superiority of man over all other animals, and even of one man over another; because the size of the brain compared with that of the face was the largest. This sounds silly enough; and yet this is, in truth, neither more nor less than an enunciation of Camper's celebrated "Facial Angle"—one of the most popular, and apparently successful, tests of this kind that has been proposed; and which continues in favour with many physiologists. This angle (as all know) was formed by a line drawn horizontally from the roots of the incisor teeth of the upper jaw, to the opening of the ear, which, being intersected by a line drawn perpendicularly from the same incisor teeth to the most elevated part of the forehead, constituted an angle, the capacity of which was to be taken as the measure of intellect. Now, it happened that, in this mode of comparison, there accidentally existed an element of truth, which accounts for its apparent success in many cases. The perpendicular line, in fact, gave a rude measure of the degree of projection of the forehead, or development of the anterior lobes of the brain, which are agreed upon by all observers, as more particularly connected with the intellectual powers. The more the forehead projected, the larger the angle would become—hence the apparent truth of the test:—but, on a closer view of the subject, it will not bear examination. The facial angle of the infant is greater than that of the man, (as 90° to 86°, according to Cuvier)—hence the infant should have

superior intelligence. The facial angle, in nearly three-fourths of the lower animals, is, according to Blumenbach, the same; yet how different are these animals in their various degrees of intelligence! But it is unnecessary to dwell upon the incompetency of methods of investigation, which took the whole brain for a single organ, and made that the organ of intellect as a single mental power, and then attempted to establish the relation between the two, by comparing the brain with something between which and the brain no necessary relation existed.

A new observer now appeared in the field—a man rarely endowed with the power of observing facts and thinking for himself—a close interrogator of nature, and a strict adherent to the inductive method of investigation. This was the celebrated Dr. Gall. In attempting to investigate the functions of the brain, he did not look upon it as a single organ exercising a single function; but, regarding it in its natural condition as a congeries of organs, or collection of parts, he endeavoured to determine the use or function of each, by comparing the developement of one part with that of another, in the same brain, taking size as a measure of power. The result of his observations was, to lead him to the conclusion, that the intellectual organs, or the parts of the brain by which our intellectual powers are manifested, have their seat in the anterior lobes of the brain: the organs of the moral powers are situated in the superior parts; while the lower propensities or passions, which we share in common with the inferior animals, have their seat below and behind.

The line of investigation pursued by Dr. Gall, in endeavouring to discover the functions of the brain, was free from many objections that held against other methods; and, being in itself good, could not but lead to good results. This was a physiological, not a phrenological question.

NOTICES OF BOOKS.

1.—Views of the Architecture of the Heavens; in a series of Letters to a Lady; by J. P. Nichol, LL.D., F.R.S.E. Professor of Practical Astronomy in the University of Glasgow; 8vo. pp. xij., 226; Edinburgh, London and Dublin, 1837. Dr. Nichol's object, in these Views, is—"to state what recent times have evolved concerning the vastness of the Universe," in simple popular language. This subject is properly distributed into three distinct parts under which he treats successively of—the Form of the Existing Universe, of the Principle of the Vitality of Stellary Arrangements, and of the Origin and probable Destiny of the present Form of the Material Creation. He then adds Notes on the planetary system, on the orbits of double stars, on the geological changes, and on the exact places of the more important objects represented in his plates. These are thirty-two in number, and their execution is so perfect that, in most cases, they will amply compensate for the want of powerful telescopes. Dr. Nichol's Views, in aim and accomplishment, merit the highest commendations: their "*Nebular Hypothesis*" will conduce effectually to the

solution of not a few hitherto unsurmountable difficulties both in Astronomy and Geology.

2.—The Tourist in Spain and Morocco, by Thomas Roscoe; illustrated from Drawings by David Roberts; 8vo. London and Paris, 1838; pp. xij. 292; embellished with twenty-one engravings. This volume constitutes Jennings' *Landscape Annual* for 1838; it closes the series upon Spain, and embraces some views in Morocco—two countries closely associated in their history and vicissitudes, and their influence upon other nations: and, in addition to former recommendations, it contains a greater variety than its predecessors, both in regard to country and to the character of the plates, as well as to the costume, manners and grouping of the subjects. It concludes with an exceedingly graphic view and description of *Constantina*, so lately the bloody scene of battle and brutality. Those who relish this sort of Literature, will be gratified with the vivacity of Mr. Roscoe's descriptions and philosophy. The Gate of the Hospicio at Madrid, the Interior of the Cathedral of Seville, and the Vestibule of the Treasury, at Tangiers, may be specified as picturesque illustrations of genuine *Landscape* scenery. Portugal, under new arrangements, will form the next volume of this "Annual:" the present rivals all the former ones; and it is equally deserving of the liberal patronage, with which the work has invariably been received.

3.—The Oriental Annual for 1828; or Scenes in India, by the Rev. Hobart Counter, B.D. with twenty-two engravings from drawings by William Daniell, R. A. 8vo. London, 1838; pp. 242.—This volume is of a more miscellaneous character than those of the "Oriental" which have preceded it. The Tales in the Text are well told: the Plates are beautiful; they are distinguished by an uncommon softness, richness and individuality. Among them, the Zoologist will find the "Fretful Porcupine" for a subject on which to ponder: the portrait of a Malabar Hindoo, with an "immense expansion of forehead betokening a mass of brains," might form a fair theme for phrenological contemplation; and, in the Mausoleum of Humayoon or the Minar at Futtepoor, or the Mausoleum of Nizam-ud-Deen Oulea, the architect will discover a "Study" admirably calculated to create a spirit of emulation and wonder. There is a fine fresh "Scene" representing a Female Peasant of Ceylon, the heroine of a Tale replete with romantic horrors. The *Scenery*, outside and inside, of this "Annual" is exquisite.

4.—A Dissertation on the Causes and Effects of Disease, considered in reference to the Moral Constitution of Man, by Henry Clark Barlow, M.D. 8vo. A. & C. Black, Edinburgh; Longman, London, 1837; pp. viii. 79. This is a new verson of the author's Inaugural Dissertation, set forth at the time of his obtaining the doctorate. It was then received in a "very flattering manner" by the Medical Faculty of the Edinburgh University, and it is now published in the hope that "by thus endeavouring to point out the true Philosophy of Disease, some addition might be made to the great argument for the power, wisdom and goodness of God, as manifested in the creation. The spirit of this dissertation is modestly indicated in its motto from Lord Bacon, "Thy creatures have been my books, but thy Scriptures much more." We like Dr. B.'s principles for the most part, and greatly respect the object of his essay: we may examine them analytically, on a future occasion.

5.—The Transactions of the Provincial Medical and Surgical Association, instituted in 1837. Part I., Volume vi.; 8vo. London, 1837; pp. xij. 122.—This volume comprises an account of the meeting and proceedings of the Association at Cheltenham, in July 1837; the Retrospective Address by Dr. Bardsley of Manchester, and Observations introductory to a Plan for the Reports of Hospitals, by Dr. Cowan of Reading, to which the Objects and Laws of the Association are subjoined. Prefixed to this *first* part, is a coloured figure of a monstrous child: the *second* will be published in the spring. Let this Association persevere in pursuing its objects, as these are every way excellent; and, in successfully attaining

these objects, it will extinguish the inflammatory efforts of all those firebrands who may exert a malicious activity in struggling to kindle the flames of dissension among its members, as the sure means of consummating the degradation of an honorable and benevolent profession.

6.—A First Grammar of the Latin Language, designed for Schools or private tuition; by the Rev. W. Butler, M. A. Head-Master of the Grammar School, Nottingham: 12mo. Nottingham and London, 1837; pp. 128.—Mr. Butler's object, in this little work of his, is to supply what he considers to be a desideratum both with schoolmasters and private teachers—a "FIRST GRAMMAR of Latin, at once *plain* in language, *accurate* and *precise* in definitions and rules, and *sufficiently comprehensive* in its plan," to guide the pupil in translating, parsing, and scanning, as usually practised in schools. Mr. B.'s book will supply the *Desideratum* indicated by him: his plan is good, its execution highly meritorious.

7.—Recreations in Retirement; by an Old Tradesman; 12mo. Nottingham and London, 1837; pp. 348.—These are very agreeable Recreations: their characteristics are modesty, sincerity and benevolence: they shew a considerable range of reading, well chosen and well digested. The author has evidently cultivated liberal principles, through the right process of observation and reflection: he is an intelligent friend of civil and religious liberty; he execrates slavery as an intolerable and inhuman abomination; and he denounces republican government as an unnatural system, tending inherently to practice the worst kinds of cruelty and despotism. The Old Tradesman's subjects are forty-one in number, and deserve every encouragement, both on account of their objects and their intrinsic merits.

9. A History of British Quadrupeds, including the Cetacea, illustrated by nearly 200 wood-cuts, by Thomas Bell, F.R.S., 8vo., London, 1837; No. xi., pp. xviii, 526.—Mr. Bell's History of British Quadrupeds is now complete, and it forms a contribution to British Zoology wherein the graphic fidelity of the figures, the beauty and aptness of the vignettes, and the perspicuous accuracy of the history, have never been surpassed. An analytical account of this admirable volume shall have a place in a future No. of this journal.

METEOROLOGICAL REPORT.

OBSERVATIONS.

Oct. 19.—An aurora borealis seen at half-past seven p. m., the air very soon afterwards clouded over.

Oct. 20.—A very remarkable sunset large and broad rays extending from the west to near the zenith.

Nov. 5.—6½ p.m. A deep blue sky on the N. and N.E. with some cloud and patches of a very yellow light. 11 p.m. a very brilliant steady and large aurora lighting up every thing; dark clouds towards the N. E.

Nov. 12.—6½ p.m. A very beautiful display of aurora, but overpowered by the full moon, quickly changing, large red patches, and streams reaching to the zenith.

Nov. 14.—11 p.m. Light clouds driving past from the North, occasional breaks in them, through which the moon is visible, it is clear in the west, a few stars can be seen, and several patches of a broad diffused fiery red, changing about and forming an interesting auroral appearance.

SEPTEMBER.

1837	Barometer.		Thermometer.		Remarks.		
Sep.	Morn.	Even.	Max.	Min.	Day.	Night.	Wind.
1	29.940		45	59	Fine, showers		Westerly
2	29.070	29.186	48	60	Showers		N. E.
3	29.244	29.420	45	57	Cloudy, rain	Rain	Northerly
4	29.473	29.363	46	57	Cloudy, fine, sun	Cloudy	Northerly
5	29.392	29.392	44	60	Fine, sun, clouds	Fine	N. Easterly
6	29.560	29.490	44	65	Fine, fog below, sun	Fine	Westerly
7	29.384		54	65	Clouds, sun, rain evng.	Cloudy	S. W.
8	29.466	29.422	48	64	Fine	Showers	Southerly
9	29.360	28.116	48	60	Cloudy, heavy showers	Cloudy	Vble. S. W.
10	29.384	29.370	50	63	Cloudy, fine		Westerly
11	29.206		55	60	Rain		S. W.
12	29.252	28.928	46	60	Fog, fine, rain p. m.		Southerly
13	28.600	28.676	50	60	Clouds, shrs., hvy rain	Showers	Southerly
14	28.932	29.070	48	60	Sun, showers, & wind	Rain	Wstly., fresh
15	29.160	29.410	42	56	Fine, sun	Clear, fine	W. N. W.
16	29.450	29.460	45	60	Rain, fine p. m.	Fine	S. W.
17	29.520	29.540	58	65	Cloudy, mild	Fine	Westerly
18	29.488	29.626	60	65	Showers	Cloudy, fine	S. W.
19	29.648	29.548	54	68	Fine, cloudy, damp]	Cloudy, fine	S. W.
20	29.482	29.422	60	67	Very fine	Cloudy	Southerly
21	29.480	29.580	51	59·5	Clouds, fog, fine	Fine	Sly. & Estly.
22	29.616	29.626	52	62 5	Clouds and sun, fine	Fine	Easterly
23	29.648	29 690	50	61	Fine, sun	Fine	Easterly
24	29.786	29.850	46	56.5	Fine, sun	Fine	Easterly, fr.
25	29. 776	29.880	44	58	Fine, clouds, sun	Fine	Easterly, fr.
26	29.812	29.708	46	57.5	Fine, clouds, sun	Fine	Calm, vble.
27	29.682	29.660	43	53	Cloudy, light showers	Fine	N. E.
28	29.634	29 595	47	54.5	Cloudy, fine	Cloudy, fine	N. E., light
29	29.582	29.520	48.5	60	Fine, fog early, sun	Fog early	E. S. E.
30	29.478	29.432	45	64	Fine, sun and cloud	Fine	Easterly, lgt.
	Mean Max. 48.75		60.58 Mean Min.				

OCTOBER.

1837	Barometer.		Thermometer.		Remarks.		
Oct.	Morn.	Even.	Min.	Max.	Day.	Night.	Wind.
1	29.390	29.516	55	60	Cloudy, fog, rain		Calm
2	29.664	29.696	52	67	Clouds, sun, fine	Fine	S. W.
3	29.608	29.472	54.5	68	Fine, sun, rain p.m.	Fine	S. W.
4	29.540	29.664	56	65	Fine, sun	Rain	S. W
5	29.730	29.652	50.5	65	Sun and clouds	Fine	Westerly
6	29.564	29 720	50	62.5	Fine, sun, clouds	Rain	West
7	29.768	29.750	4 8	62	Fine	Fine	N. W.
8	29.684	29.768	54	61	Clouds, showers, fine	Fine	N. W.
9	29.846	29.846	45	58	Fine, sun	Fine	W. N. W.
10	29.854	29.860	50	62	Fine, clouds	Fine	S. W.
11	29 890	29.970	49	62	Fine, cloudy	Fine	Westerly
12	30.040			59	Fine, cloudy		
13	30.135	30.156	42	55	Fine, all sun	Fine, eclipse	
14	30.228	30.200	38.5	51.5	Very fine, sun	Fine	Northerly
15	30.166	30.086	40	53 5	Very fine, clouds	Fine	Northerly
16	30.006	29.900	40.5	54	Cloudy, fine	Fine	Westerly
17	29.810	29.678	46.5	56	Cloudy, fine		Westerly
18	29 626	29 840	47	60	Very fine	Light rain	W. S. W.
19	29.930	29.984	41.5	54	Very fine, aurora	Fine	Calm, vble.
20	30.074	30.150	44.5	61	Very fine	Fine	Northerly
21	30.150	30.034	50	61	Very fine, all sun	Fine, cloudy	Southerly
22	29.942	29.784	48.5	63	Very fine, showers p.m.	Fine	Westerly
23	29.558	29.258	50	59	Cloudy, showers & rain	Rain	W. & S. W.
24	29.094	29 060	47	50	Showers, thunder, fine	Cloudy	W. N. W.
25	29.326	29.588	32.5	45	Fine, clouds and sun	Haze	N. N. E.
26	29.516	29.260	37	54.5	Fine, windy, cloudy	Fine	S. W.
27	29.000	29.165	45	46	Rain and wind	High wind	Westerly
28		28 860	39	49	Fine, showers p. m.		S. W.
29	28.940	28.992	35	48	Showers	Fine	Southerly
30	28.838	28.850	42	57	Wind and rain		S. W.
31	28.828	29 000	39	48	Wind and showers	Windy	Westerly
	Mean Max. 45.7			57.3	Mean Min.		

NOVEMBER.

1837	Barometer.		Thermometer.		Remarks.		
Nov.	Morn.	Even.	Min.	Max.	Day.	Night.	Wind.
1	28.450	28.584	40	54	Constant rain		West
2	28.582	28.634	37	43	Windy and showers	Showers	West
3	28.760	29.020	32.5	44	Fine, sun, showers	Fine	Light, wstly.
4	29.260	29.570	33.5	46	Fine, showers	Fine	W. N. W.
5	29.588	29 770	37	51	Fine, aurora	Fine, clouds	S. W.
6	29.848	29.910	40	50	Fine		Calm, Wrly.
7	29.930	29.882	42	51.5	Fine, cloudy	Fine	S. W.
8	29.832	29.740	37	48	Clouds, fine, sun	Fine, clear	S. W.
9	29.632	29.566	39	52	Fine, cloudy	Fine	Light, soly.
10	29.542	29.506	47.5	55 5	Cloudy, fine	Rain	Westerly
11	29.550	29.568	47	52	Fine		N. W.
12	29.636	29.760	38.5	47	Fine, red aurora	Fine	N. W.
13	29.664	29.360	38	49	Fog and misty rain	Fine	Calm, soly.
14	29.144	29.334	39.5	44.5	Rain, red aurora	Rain	Variable
15	29.600	29.676	34	42	Fine, aurora	Cloudy	Northerly
16	29.596	29.510	35	42	Fine, cloudy	Fine	N. E.
17	29.590	29.684	28	37	Very fine	Fine	Northerly
18	29.636	29.688	29	44	Clouds, light showers	Fine	Westerly
19	29.480	29.390	40	53	Cloudy, rain		S. W.
20	29.374	29.390	39	48	Fine, clouds, showers	Cloudy	Northerly
21	29 372	29.530	35	44	Windy and showers		W N. W.
22	29.400	29.366	43	54	Cloudy, light rain	Rain	S. W.
23	29.220	29.330	50	52	Rain, fine in evening	Clouds & wind	S. W.
24	29.492	29 550	39	46	Fine		Calm, wstrly.
25	29.684	29.790	35	43	Very fine, all sun	Fine	Northerly
26	29.500	29.086	33	48 5	Wind and showers	Fine	S. W.
27	29.126	29.988	35	44	Fine, showery		Southerly
28	29.900	29.842	39	42.5	Cloudy, light rain	Fine	W. N. W.
29	29.146	29.268	32	38	Fine, sun	Fine	Northerly
30	29.172	28.090	32	49.5	Cloudy, rain		S. W.
	Mean Max. 66.6			52.9	Mean Min.		

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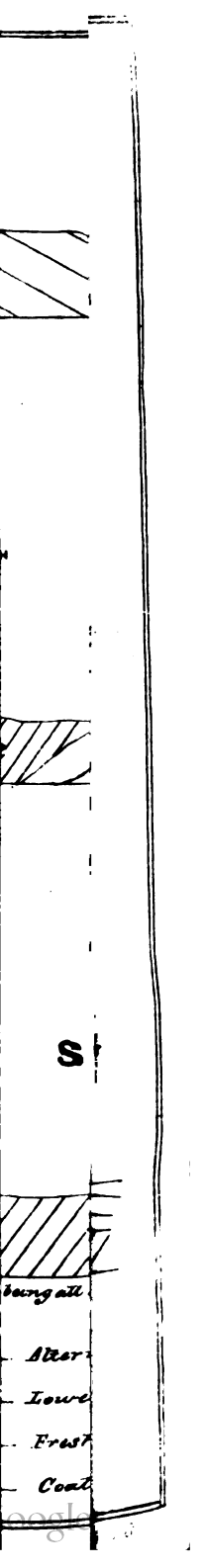

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THE ANALYST.

A POPULAR SKETCH OF THE GEOLOGY OF THE COUNTY OF LEICESTER.*

By J. B. Jukes, B.A., F.G.S.

The design of the following sketch is not to convey any new information to the scientific geologist, but to lay before the general reader a short and intelligible description of the geological facts to be observed in the county of Leicester, and the inferences to be drawn from them. The science of Geology has, by the labours of many distinguished individuals during the last few years, aided by the advancement of the other natural sciences, been at length established on a firm and certain foundation—its leading principles and general outlines, as well as its most important conclusions, having been placed beyond the reach of controversion. The knowledge, however, of these principles and these conclusions is as yet possessed by comparatively few persons, even among the educated classes of mankind. What is, therefore, more especially wanted at the present moment, is to bring the matter home to every man's own door, to open his eyes to the geological facts which everywhere surround him, and to set him reasoning upon their causes of production. Geology is a science that, more than any other, admits of being made popular in every sense of the word; for though in some portions of its range it becomes matter for the profound and abstract speculations of the mathematician and astronomer, in others it links itself in with the

* This will probably be the first of a series of similar papers on the Geology of the Midland Counties.

every-day operations of existence, teaches the farmer how to drain his land or improve his soil, the builder where to procure his stone, —directs the miner in his search after the hidden treasures of the earth—enlightens the eye of the artist as to the causes of the beauty and variety of the landscape—brings to the cabinet of the naturalist whole hosts of new forms of animal and vegetable life—and excites the interest and curiosity of every man, since it details to us the history (and a wonderful history it is) of the globe on which we live. We learn from Geology that there is not a single particle of earthy matter, from the mighty masses of huge mountain-chains down to the little rounded pebble that we tread beneath our feet, but has been produced and placed in its present position by the action of regular and long-continued causes, and has attached to it "its strange eventful history." The observations that follow, then, are intended to serve as a few connected hints to call the attention of the inhabitants of the county of Leicester, or of those acquainted with it, to the facts that may be observed in it, and to the story which those facts unfold to us. I must premise, however, that if some portions of the story should, to the ungeological reader, seem not to be supported by sufficient evidence, he must not therefore conclude that evidence does not exist, since its production in every case would have made this paper a general geological treatise, rather than a sketchy description of a particular district. This description will consist of

I. A short account of the character and composition of each of the different masses of earthy matter of which the district is composed, and of their relative position with respect to each other, beginning with the uppermost and going down to the lowest.

II. Commencing with the lowest or the oldest—a succinct history of the causes which formed the different strata, gave them their peculiar characters, and placed them in the positions they now occupy.

The different masses of earthy matter, or formations, as they are called by the geologist, which compose the county of Leicester, are the following :—

I. *Aqueous or stratified rocks, in their order of superposition.*

1. Gravel, or diluvium
2. Lias
3. New red sandstone
4. Coal measures
5. Mountain limestone
6. Cambrian rocks.

II. *Igneous or unstratified rocks, having no definite order of occurrence or superposition.*

1. Basalt
2. Sienite, or granite
3. Porphyry.

Gravel, or Diluvium.

Over the whole surface of the county, on the tops of the hills up to a certain height, as well as in the valleys, is spread a vast accumulation of water-worn materials, with every kind of irregularity as to depth, character, and composition. It is sometimes a blue or red clay, containing pebbles, fossils, and broken pieces of all the rocks of the neighbourhood; sometimes a coarse sand; sometimes nothing but a mass of pebbles of all sorts and sizes. The character of the matrix, as it may be called, in which the pebbles are sometimes imbedded, seems frequently to have a relation with that of the substratum on which it rests: thus on the eastern side of the county, where clays and marls constitute the substrata, the diluvium is generally a mass of clay; while in the neighbourhood of Charnwood Forest, on the coal measures and new red sandstone formation, it consists more frequently of sand. The harder and larger materials of which it is composed may generally be traced to their parent home either by their mineral character or their organic remains; they consist of

1. Rounded masses of hard chalk, and chalk flints.
2. Pieces of limestone, sandstone and ochraceous nodules from the oolites.
3. A vast abundance of fossils from the lias and pieces of lias limestone.
4. Pebbles of coal, and rarely one of mountain limestone.
5. Masses of slate or porphyry from Charnwood Forest, and of sienite from Mount Sorrel, Grooby, and other places.
6. Quartz pebbles similar to those derived from the Lickey hill, near Birmingham, but some of which may possibly come from Harts-hill near Atherstone, or from some part of Charnwood Forest.

The condition of these materials has always a reference to the distance which they have travelled; thus the pieces from the chalk, none of which now exist within fifty or sixty miles, are always perfectly round and smooth.

The oolitic pieces, which come from the country immediately east

of Leicestershire, have all their sharp angles worn round, but are frequently of all shapes. The fossils and other pieces from the lias are often little altered from their original condition. The perfect smoothness and roundness of the quartz pebbles favours the supposition of their distant origin.

This dependence of the condition of the masses on their distance from their parent rock may be admirably seen in tracing the boulders derived from the Charnwood Forest district. These seem to have been drifted chiefly in the S.W. direction, as I never observed them to the N. or E. Over all that table land which runs a little west of Leicester, the blocks are strewed in great abundance. As you approach the forest, they become more numerous, more angular, and of a larger size, so as in some instances to weigh two or three tons, but in travelling southwards their size and number decrease, till at the distance of twelve or fifteen miles, if you find a boulder of Mount Sorrel stone for instance, it will not be larger nor more angular than a man's head.

The quantity of diluvial materials accumulated in any one place, varies from one to fifty or sixty feet in thickness. The mass sometimes assumes a stratified character, beds of fine sand alternating with beds of pebbles or of clay; these beds, however, are very irregular, being never continuous for more than a few yards, and sometimes all appearance of regularity is lost, and the whole is nothing but a confused heap. In the beds of sand it is not unfrequent to see layers of pebbles of coal (derived from the Ashby or Derbyshire coal fields) from the size of a man's fist downwards; and these having been observed in sinking wells and making excavations, have sometimes led to the erroneous supposition that coal existed immediately beneath. Mankind easily believe what they eagerly desire, or it would at once have been perceived that merely from the occurrence of these pebbles, there was no more reason to expect to find coal beneath, than there was to find chalk, oolite, slate, or sienite, pieces of all these being equally found in the diluvium. The superficial water-rolled materials here spoken of, under the general term diluvium, are never, so far as I am aware, found high upon the hills of Charnwood Forest, but over all the rest of the county they are distributed sometimes so profusely as greatly to obscure its study, masking the *inferior* rocks from our inspection. We will now, however, suppose all superficial matters to be stripped off, and the regularly bedded rocks exposed to view, the first which calls our attention being

The Lias.

The general dip or inclination of the stratified rocks of England being to the east, we shall in any particular district find the highest formation on the eastern extremity,* older or lower rocks rising out to the surface as we proceed westward. This is the case in Leicestershire. The very eastern extremities of the county, at its junction with Northamptonshire, Rutland, and Lincolnshire, are occupied by the inferior oolite, the lowest bed of the great oolite formation of England. From beneath this inferior oolite comes out the lias with a very gentle rise to the west, so that though its whole thickness may not be more than four or five hundred feet, it comprises a tract of country from five to ten miles wide. The western boundary of this tract, or the line where the bottom of the lowest bed comes to the surface, enters Leicestershire a little north of Loughborough, and runs by Barrow-upon-Soar, Sileby, Queniborough, Humberstone, Ebington, Kilby, and a little north of Lutterworth into Warwickshire.

The lias consists for the most part of shaly clay with bands of hard stone, called marlstone, in its middle portion, and bands of limestone in its upper and lower parts. The lower portion in Leicestershire, forms a line of low hills running in the neighbourhood of the places mentioned above, and contains several thin beds of limestone, which is occasionally quarried and used for agricultural or other purposes. That worked at Barrow-upon-Soar is the most celebrated, both for its organic remains and for its useful property of hardening under water when turned into cement. There are at Barrow seven beds of limestone, none of which much exceed a foot in thickness, and which are separated from each other by beds of shale varying from one to seven feet thick. There frequently occur in the shale hard, flattened, nodular masses of stone, which, when split open, display a fossil fish with its beautifully enamelled scales, or the bones of a saurian reptile.

These relics, together with the Belemnite, the Ammonite, the Nautilus, and the shells called Plagiostoma and Gryphœa, are found also both in the shale and the limestone; but the latter fossils are not so numerous as in some other places, and at Barrow all are valued at exorbitant rates by the native collectors. The fish are sometimes preserved with great delicacy, even the fine rays of the tail and

* This rule has of course its exceptions in particular districts, where local causes have modified the dip or inclination of the strata.

fins, and the orbit of the eye, being perfectly and beautifully marked.* A fine skeleton, also, of the Ichthyosaurus was discovered at Barrow a short time since, and purchased by Mr. Laurance, of Leicester, for the Birmingham Philosophical Institution, in the museum of which it now forms the chief ornament, its bones having been very carefully and successfully denuded of their stony envelope.† The beds of limestone are the only parts of the lias which are of any utility; it forms generally a low uninteresting country, the land being cold and bearing few trees, while the brooks and rivers are slow and sluggish streams.

New Red Sandstone.

Beneath the lias lies the new red sandstone formation, the upper beds of which accordingly come out to the light of day where the lowest of the former terminate. In Leicestershire, therefore, the before-mentioned boundary of the lias will form the eastern boundary of that portion of the new red sandstone which appears at the surface.

The new red sandstone of England consists of

1. Red marls, with green and white stripes, containing gypsum and rock salt, 200 or 300 feet.
2. Red and white sandstones, with occasional beds of marl and conglomerates (masses of pebbles cemented together) 500 or 600 feet.
3. In the northern part of England, magnesian limestone, 200 or 300 feet.
4. Lower red sandstone, about 100 feet, but variable.

The two latter portions are nowhere seen in Leicestershire, but the upper ones are well and distinctly exhibited. The first or the variegated marls, coming out from beneath the lias, gradually rise to the west till they form a line of low hills parallel with that of the lias before mentioned, and from two to three miles to the west of it. These hills, from the village of Lyston southwards, form an escarpment,‡ overlooking the valley of the Soar. They are, however, fur-

* For figures and descriptions of fossil fishes I must, of course, refer the reader to the splendid work of M. Agassiz, now publishing, which ought to have a place in every public library in the kingdom.

† An account of this specimen was lately read to the members of the Institution by Dr. Ward, of Birmingham, from which an extract appeared in the last number of *The Analyst*.

‡ An escarpment is the steep side of a range of hills, where the ends, or

rowed by many transverse valleys, down which small brooks run into that river. About half way down this escarpment the gypsum is generally worked, the section in the large quarry near Leicester, at the bottom of Humberstone gate, being—

	FEET
Red marl, with streaks of white and green, and having near the middle lenticular masses of gypsum lying in the plane of the beds	50
Greenish and white gypsum, with fibrous veins	5
A bed of dark red marl, one half of its substance being intertangled veins of gypsum	5
Red marl, &c.	—

Wherever the base of this upper portion (the variegated marls) is exposed, it will be found, I believe, to rest upon some whitish sandstones; but the country is so much covered up by diluvium that the only place where I have been enabled to verify this fact is the neighbourhood of Leicester. In going down from the hill on which Leicester race-course is situated, toward the Soar,† we first of all descend the escarpment of the variegated marls, about half way down which are some old gypsum pits. Having crossed the Soar, we should find in the ditch of the Narborough-road some sandy shale of a light green colour, which, gradually rising to the west, forms the capping of the Dane hills: and below it are some thickish beds of a light coloured sandstone, very soft when first got out of the quarry, but which hardens on exposure to the weather. The Dane hills are covered with old quarries worked in this stone, of which the castle, several of the churches, and other old structures in Leicester are built. The stone, however, though handsome when fresh, assumes with age a rotten worm-eaten appearance, as it wears very unequally. It is, I believe, the same as the Warwick sandstone, but there have been, as yet, no organic remains discovered in it. A saurian tooth, a bone, or the track of an animal, would well reward the perseverance of collectors; and I hope my friend Mr. Laurance will, ere long, be able to lay before the Leicester Philosophical Society some specimens similar to those which the labours of Dr. Lloyd have brought to light near Warwick. The range of this sandstone to the north

faces, of the different beds of which they are made up are exposed to the view, one beneath another. The slope of the other side, or back of the range as it is called, depends generally on the rate at which the beds dip or incline inwards from the escarpment.

† See section No. 1.

and south is obscured by diluvium,* but some indications of it may be seen about Enderby and Narborough, and Enderby church is built of it. Its width at the surface is about two miles, as some small quarries may be seen in it on the Hinckley road, between the second and third milestones. This sandstone apparently forms the uppermost and thickest bed of several similar ones, which, alternating with red marls, spread over all the western portion of the county, except where inferior rocks are protruded to the surface. The country affords no natural section; but the engineer of the Bagworth colliery informed me that they passed, in their sinking, through upwards of three hundred feet of alternating red marls and white sandstones, one of the latter of which was fifty feet thick; but no accurate account had been kept of their relative position. Every portion of the new red sandstone formation, in Leicestershire, is always as nearly horizontal as possible, while the formations on which it rests are frequently highly inclined.† Thus level beds of red marl may be seen resting on the upturned edges of the slates of Swithland, or the sienite of Grooby, on the mountain limestone of Ticknall and Grace Dieu, while a considerable thickness of this formation spreads in level sheets over some portions of the coal field without any regard to the dislocations or different inclinations of the beds of the coal measures.

Coal Measures.

The next formation in the geological order below the new red sandstone, is that which is commonly called the coal measures, consisting of alternating beds of shale, sandstone, coal, and ironstone. In some parts of England, there is a regular passage or gradation from the new red sandstone into the coal measures, the deposition of the different materials not having been interrupted by any disturbing forces. In Leicestershire, however, this is not the case, the lower portions of the new red sandstone, and possibly the uppermost beds of the coal measures, being not known to exist in any portion of the county.

* Dr. Lloyd, of Leamington, informs me, that one of the characters of the Warwick sandstone is irregularity, occasionally thinning out and then setting in again along the same line of country.

† When this is the case, the two formations are said to be *unconformable*. It always denotes that an interval elapsed between their depositions, during which the lower strata were affected by disturbing forces before the others were deposited upon them.

The junction of the two formations is quite abrupt, without any gradation of one into the other, and the position of the new red sandstone is, as before stated, always unconformable to that of the coal measures. They consist of many beds of coal, alternating with shales and sandstones, of which the shales greatly predominate; good beds of ironstone also occur, but are not now worked. For details of the sinkings, the number and thickness of the several beds, as well as for figures of all the characteristic fossils of the Ashby coal field, I must refer the reader to the late Mr. Mammatt's elaborate work upon that district, confining myself here to a mere outline. The Ashby coal field may be divided into three distinct districts, or basins, as they may be termed:—1. That of Measham on the south west, which is now little worked, being almost exhausted; 2. North of the Measham basin lies that of Moira, containing the collieries of Moira, Gresley, Swadlincote, Stanton, and Newall; 3. East of both these lies what may be called the Swanington basin, including the collieries of Lount, Pegg's Green, Coleorton, Whitwick, Snibston, Heather, Ibstock, and Bagworth. The boundaries of these basins are, however, irregular and ill defined, their edges being much covered up and obscured by unconformable beds of the new red sandstone.

Of the Measham basin little or no information is now to be obtained. The Moira basin occupies a district about five miles in diameter, the Moira colliery being the deepest and most centrical. The main coal at Moira is thirteen feet thick, consisting of two beds, of which the uppermost has a thickness of seven feet, and, being there the best, is the only part worked. Proceeding north west from Moira, however, these beds become separated by a parting of shale, which increases from eighteen inches, at Swadlincote, to twenty yards, which is its thickness at Newall; and over this district the lower coal is the best and most worked. At Stanton, however, one mile west of Newall, the parting being eighteen yards thick, the upper bed regains its quality, and is the one worked in that colliery. The Moira basin is much broken by faults,* the principal of which run twenty or thirty degrees west of north, and are crossed by others at right angles to them. One of the largest of the north west faults runs in a directly straight line from Brambro, through Moira colliery, Swadlincote, and Spring Wood, to near the Decoy in Bretley Park,

* A fault is a fracture of the strata, causing an elevation or depression of the beds on one side of it from their original level.

a distance of five miles. It causes a down cast to the east of four hundred and twenty feet.* A singular circumstance with regard to this coal field is the fact that for the first three hundred feet from the surface the water is perfectly fresh and soft, but below that depth it is quite salt. Advantage has been taken of this circumstance, to establish baths, but the salt is not in sufficient quantity for the profitable establishment of salt-works.

The Swanington basin has a triangular shape, the apex being about Lount, and the sides spreading out to Whitwick and Heather. It dips gently to the south east, its edges being turned up to the south west and north east respectively. It thus forms a long trough, the northern end of which is raised, and which slopes gradually to the south east till it becomes covered over with level unconformable beds of new red sandstone. This covering of red marls and sandstones is, at Whitwick and Snibston, about a hundred and fifty feet, while farther south, at Bagworth, it is three hundred feet in thickness. This basin is affected by very few faults, but the different beds seem rather irregular in thickness and extent, the beds of coal being the most constant. It is indeed, most probably, the same bed of coal which is worked as the "main coal" over the whole of the Ashby coal field, except at Lount and some other extreme points, where beds lower than the "main" are worked. At Whitwick and Snibston a mass of basalt, in one place sixty feet thick, is found in the upper portion of the coal measures. This, where it touches the coal, has burnt it into coke, and has changed a sandstone into a compact rock, almost as hard as itself. Some trials have been made for coal south of Bagworth, but nothing certain seems yet to have been ascertained respecting the southern boundary of this basin; and any workings in that part of it must always be attended with considerable risk and great expense, on account of the overlying measures of red marl.

Mountain Limestone.

Of the mountain limestone, which is the next formation in the descending order below the coal measures, some small patches occur a few miles north and east of Ashby-de-la-Zouch. Of these the largest is that on which the villages of Staunton Harold, Calke, and

* That is to say, that the beds east of this fault are four hundred and twenty feet lower than the beds on the west of it, with which they were once continuous.

Ticknal stand. The others are five small isolated hills, which run in a directly straight line, a little west of north, from Grace Dieu Abbey, namely, Grace Dieu, Osgathorpe, Barrow Hill, Cloud Hill, and Breedon Hill, the extremes of this line being rather more than four miles apart. The first-mentioned district is about two miles long from north west to south east, and rather more than half a mile broad. It is a low saddle-shaped mass, the northern side of which dips fifteen degrees to the north east at Ticknall, and is overlaid by level beds of red marl; and the southern may be seen, near the first pool in Calke Park, to dip south west, at an angle of about twenty degrees, and thus buries itself beneath the Ashby coal field, of the northern part of which it no doubt forms the floor.* One of the quarries at Ticknall exhibited the following section :—

	FEET.
1. Level beds of red and variegated marl	15
2. Beds of dolomitic limestone	5
3. Shale, with beds of limestone	20
4. Hard blue limestone	10

Nos. 2, 3, and 4 are full of mountain limestone fossils, and dip fifteen degrees north east, while No. 1 is perfectly horizontal. At Dimminsdale, a little south of Calke, the limestone lies nearly level, the quarries being just about the crown of the arch. It consists here of some alternations of shale and gritstone resting upon limestone, of which about forty feet were exposed. Parts of the limestone are dolomitic, or magnesian, and contain bunches of galena, or lead ore, which in one place is worked in what is technically called a pipe vein —that is, a circular excavation following the run of the ore. The eastern bank of the little valley of Dimminsdale apparently consists of shale to the thickness of a hundred feet, and on the top of it are some old quarries in a sandstone which probably represents the millstone grit, and of which some traces may also be seen on the south side of the first pool in Calke Park. As soon as you have ascended this bank, however, you find yourself on the level beds of the new red sandstone again.

The five small hills before mentioned as belonging to the mountain limestone formation, have all a westerly dip, the angle varying from twenty degrees, which is that of Grace Dieu, at the southern extremity of the line, to seventy degrees, which in some places is that of Breedon at the northern extremity. The limestone of Breedon and

* See section No. 2.

Cloud Hills is for the most part completely dolomitised, or converted into magnesian limestone, with a cellular structure running along the line of the beds. The fossils, too, are all in the state of casts, but they are always such as are characteristic of the mountain limestone, as *Spirifers*, *Productæ*, *Enomphali*, or *Bellerophons*. Breedon is so traversed by faults and joints in various directions, as at first sight to have its stratification almost obscured: this, however, by a little attention, may always be perceived, and will be found to dip fifteen degrees to the south of west, at an angle varying from thirty-five to seventy degrees. The limestone of Grace Dieu is similar to that of Ticknal, only particular beds of it being magnesian. These hills are everywhere surrounded by level beds of new red sandstone, out of which they rise abruptly towards the east, with the broken edges of their beds sticking up into the air, and seemingly unconnected with any other portion of the country. We shall, however, shortly be able to connect their elevation with that of the slates of Charnwood Forest.

Cambrian Rocks.

Of the rocks which, in other localities, lie immediately beneath the mountain limestones—namely the old red sandstone and the silurian formations—Leicestershire presents no example whatever. In South Wales the old red sandstone has a thickness of upwards of 10,000 feet, and the silurian system which lies below it consists of four great formations, each many hundred feet thick, and each stored with its peculiar and characteristic fossils. In this county, however, no trace of any of them is anywhere to be perceived. Of the next inferior group of rocks, however, which, coming out from below the silurian, form the slate mountains of Wales, Cornwall, and Cumberland, we have, in Leicestershire, a miniature example in the hills of Charnwood Forest. This system of rocks is termed by Professor Sedgwick the Cambrian system, and he divides it into two great groups, the upper and lower Cambrian, each having a very great thickness, and each, in Wales, containing organic remains. To which division of the Cambrian rocks we must refer those of Charnwood Forest, is, in the absence of organic remains in that district, of course doubtful; Professor Sedgwick himself being unable to decide the point. The discovery of the merest trace of shells, then, or other fossils in the slates of Charnwood Forest, would be highly valuable. The rocks themselves consist of every variety, from a coarse greywacke to a

fine-grained clay slate. The finer portions have generally a well-defined cleavage, or fissibility, in a certain direction that gives to the rock its slaty character. The direction of this cleavage, or way in which the rock splits into slate, is not along the beds, as would at first be supposed, but across them, the same lines traversing the whole of the beds from top to bottom. The original bedding of the rock may be discovered by observing its variations in colour and texture; as where a coarse band may be traced between two fine ones, or, where they exist, by the beds of organic remains. Bands of different colours, technically called "the stripe," may be frequently observed, which are always parallel to the true beds, and by their help the real dip of the strata may be found out. Some general, but at present obscure, agency has so acted upon these rocks as, some time after their formation, to have sealed up as it were their original beds, and given the mass a tendency to split in other directions. Upon this subject, however, I must refer the reader to Professor Sedgwick's paper on the "Alterations produced in Rocks after their Formation," in the third vol., N. S., of *The Geological Transactions*. The slate rocks of Charnwood Forest are frequently associated with porphyries, which occur either in beds or in irregular masses; and over all the north west portion of the district, the porphyries or igneous rocks are by far the most abundant material, having almost entirely usurped the place of the aqueous rocks, and altogether obscured their stratification. This is the case with Bardon Hill, and the hills north and east of Whitwick. In the other parts of Charnwood Forest, however, the dip or inclination of the strata is quite plain and easily ascertainable by any one who has had the different lines of cleavage, stratification, and joints clearly pointed out to him.* By an examination of the district, it will be seen that a little north of Bradgate Park, and between the hill called Old John and Swithland, there is a valley called Lingdale, which runs a little west of north and east of south. A line drawn along this valley and continued each way, will divide the Charnwood Forest district into two unequal parts, the largest being that to the south west of the line. Now the rocks of which these two parts are composed dip in opposite directions—all those lying to the north east of this line dipping to the north east, and those lying to the south west of it dipping south west.† This

* My own knowledge of this district, and of the north of the county generally, was gained in the autumn of 1837, in an excursion, during which I had the advantage of the tuition of Professor Sedgwick.

† See section No. 3.

line, then, is called the anticlinal line, the beds inclining downwards from it on either hand. The amount of their inclination varies, but it is frequently as much as sixty or seventy, and I never saw it less than twenty-five, degrees.

Sienite.

In describing the aqueous, or stratified, rocks, we have seen two kinds of igneous rocks associated with them, namely basalt with the coal measures at Snibston, and porphyry with the slates of Charnwood Forest. There is yet, however, another igneous rock, which makes a conspicuous feature in the country, but is not so intimately associated with any aqueous rock as to admit of being described with it. This is the sienite, or granite as it is commonly termed, from which indeed it differs only in the scarcity or absence of mica. The sienite occurs in detached hills round the outskirts of Charnwood Forest, at Mount Sorrel, Grooby, Markfield Knoll, Cliff Hill, and in Bradgate Park; it also protrudes above the new red sandstone, a few miles South of the Forest district, forming the hills of Enderby and Croft, and being visible near Narborough, at Burrow Hill near Potter's Marston, at Stoney Stanton, at Sapcote, and probably at some other spots with which I am not acquainted. It becomes a question of some importance to determine how far this latter group is connected with that which fringes the south of Charnwood forest. If (as I have been informed) the sienite was reached at the depth of eighty yards, in a boring that was made near Kirby Muxloe, it would go far to prove that there is a connected sienitic ridge running across the county, beneath the level beds of new red sandstone, the higher peaks of which only appear at the surface at different places. It is a fact, however, that the type of the southern group differs materially from that of the northern, being less granular and crystalline, and more compact and porphyritic looking. How far, however, this difference may be due to the difference of the conditions under which they were produced, or how far it might bear us out (in the absence of contrary evidence) in supposing them to be only connected at a considerable depth, I am not prepared to say. There is certainly no reason to suppose them to have been produced at different periods of time.

These are the principal materials of which (so far as has yet been ascertained) the county of Leicester is composed, and the positions which they occupy with respect to each other. It remains for us

now to take a hasty glance at the history of the causes which produced these materials and placed them in those positions.

To begin, then, with the lowest, and therefore the oldest rocks, which are found in the county, the slates namely of Charnwood Forest, we see that a great sea once existed over this portion of the globe, at the bottom of which there was deposited a vast amount of earthy sediment. This sediment was gradually accumulated, since it consisted of alternate beds of fine and coarse materials, successively deposited, and not mixed up the one with the other. We know that this sea was inhabited by various animals, for though none of their remains have been found in the slates of Charnwood Forest, there are abundance of them in the other portions of the same rocks which form the mountains of Wales. This absence of organic life over that portion of the bottom of this sea which is now visible in Leicestershire, may possibly be due to the action of volcanic causes, for along with the aqueous rocks formed in it, we find beds of igneous rocks, which we know to have been poured out in a state of fusion, like great flows of lava, and to have been afterwards covered up by other aqueous sediment. Great masses of these melted rocks were also in some places protruded among and into the previously formed aqueous rocks, so as sometimes to obliterate their stratified character. These igneous rocks having cooled down under pressure, have become what we term porphyry; and the aqueous rocks having become indurated, and having at some subsequent period been affected by a peculiar agency, which has given them the property of fissibility in a certain direction, are now what we call slate and slate rock. Giving to the whole mass a general term, they are called Cambrian, because the same rocks form a great portion of Wales.

After the formation of these Cambrian rocks, there elapsed an *interval*, of what length it is impossible to say, but sufficiently long to allow of the accumulation in some localities of stratified rocks many thousand feet thick, and for great changes to take place in the animal and vegetable kingdoms of our globe. During this interval we have no indications given us of the state of this particular district; either it was dry land, or, if sea, no strata were deposited in it; or lastly, if strata were deposited, they have since been destroyed.

After the lapse of this long period, however, whatever it may have been, we again arrive at something certain, and find that sea existed over at least a portion of the district, in which were deposited those calcareous materials which now form what we call the mountain limestone. This sea was full of animals, more especially *Polypi*, *Radiaria*

and *Mollusca*, since we find corals, encrinites and shells in great abundance at Ticknal and the other before-mentioned places. This sea, after being partially filled up by these materials, which were deposited by a slow and gradual process, became subject afterwards to new conditions, the animals which inhabited it gradually perished, and its place was either occupied by freshwater, or it itself was filled with materials swept from freshwater and from the land. These materials, strewed in repeated successions over wide areas, consisted either of mud, sand, or vast accumulations of vegetable remains. The mud when deposited at the bottom and partially indurated, became shale, or when containing much iron was converted into ironstone, the sand was compacted into sandstone, and the vegetable substances undergoing a chemical change beneath the vast pressure of the superincumbent materials, were turned into beds of coal. These vegetables when examined by the botanist, are immediately declared by him to have been the produce of a tropical temperature, and the greater part to have lived upon the land, although all differ and many of them widely so, from any now known to exist. The perfect state of their parts forbids the supposition that they were washed from any distant regions, and though we cannot point out where the land was situated on which they grew, we are yet assured that this portion of the globe was once much hotter than at present, and that its lands were covered with the thick and matted vegetation of an Indian forest. The period which the coal measures occupied in their formation was long enough to allow of many successive growths and partial destructions of whole forests, and for different materials to be successively and gradually accumulated, till they formed a thickness of considerably more than a thousand feet.

At the close of this period, and before any of those materials which now rest upon the coal measures were deposited, great disturbances took place over this district. Dislocating and upheaving forces acting from below, broke up the coal measures and other previously existing rocks, caused the great faults which are everywhere found in them, set on edge the masses of mountain limestone north-east of Ashby, and bent up the Cambrian rocks which now form the hills of Charnwood Forest. It may be asked, how it is known that all these dislocations took place at this precise period, after the formation of the last of the coal measures, namely, and before the deposition of the upper part of the new red sandstone. The latter condition is quickly verified from the facts before mentioned, that the beds of new red sandstone when lying on the upturned edges of the

rior rocks, are always horizontal: it is obvious, therefore, that
n the forces acted which disturbed those rocks, the beds of new
andstone did not exist, or they would likewise have been dis-
d. The other conclusion, however, will to the ungeological rea-
not so evident. But if he trace the anticlinal line which runs
Charnwood Forest, and produce it to the north, he will find
's parallel with that of the five hills of mountain limestone be-
mentioned, and runs about half a mile to the *east* of them. Now this anticlinal line is the line of direction along which the upheaving force acted that elevated the forest, giving to the beds west of that line a westerly dip, and these mountain limestone beds also lie to the west of the line, and have likewise a westerly dip. The western side of that line also is that on which the greatest amount of upheaving force was exerted, as we see by its effects, and we should consequently expect to find traces of its action further on that side than on the other. From these and other considerations, it is clear that the same force which uplifted the Charnwood Forest rocks, likewise set on edge those hills of mountain limestone, and the period of the uplifting of the mountain limestone we know to have been that of the coal measures, and therefore we get the whole linked together as the result of one general cause acting after the deposition of the coal measures, and before that of the upper portion of the new red sandstone. This result, if further proof were necessary, would be greatly strengthened by examining the adjacent districts. In the Warwickshire coal field, for instance, we find the Cambrian rocks of Hartshill, which must be nearly of the same age with those of Charnwood Forest, dipping in the same direction and nearly at the same angles with the coal measures that rest upon them, the elevation of both being evidently due to the same exertion of upheaving power. It is remarkable also that the line of elevation of these rocks in Warwickshire, is for the most part parallel with that of Charnwood Forest. In Warwickshire, however, the lowest part of the new red sandstone formation is seen resting on the coal, and evidently affected by the same forces of elevation with it.* It passes down into the coal measures moreover by a regular gradation, and near the junction of the two, occurs the same thin band of freshwater limestone as is seen in Shropshire and Lancashire, in the same situation. The upper portion of the new red sandstone, however, occurs in other parts of this district, in level unconformable beds, so that we are enabled here still

* See section No. 3.

farther to limit the period of elevation of the coal field, and say that it took place between the formation of the lower part of the new red sandstone system and the upper of the same. Whether this would be true of the Leicestershire district we cannot determine, since here the lower portions of the new red sandstone are wanting, or at all events not visible at the surface. We can, however, in Leicestershire point to one of the very agents which were accessary to all this disturbance, namely the sienitic rocks before mentioned. These, in their expansive struggles at escape, forced themselves while yet molten masses through the cracks and fissures which were then produced in the inferior rocks, and having cooled under the pressure of great depths of water or other materials, assumed the crystalline structure which they now possess. The only anomalous circumstance respecting them is, that they are on the outskirts of the Charnwood Forest district, and not in its centre.

Over the broken and irregular surface thus formed by these forces of disturbance, a sea still flowed, which, upon tranquillity being restored, deposited the level beds of sandstone and marl which form the upper portion of the new red sandstone. These filling up the inequalities, smoothed the whole over up to a certain height, leaving only the highest portions of the previously existing rocks uncovered by its beds.*

After the deposition of all this red sediment, the sea became again the dwelling place of numerous animals different from any which had gone before them. Mollusca crawled upon its bed or floated on its calmer surface, fishes sported in its waters, and the terrific Ichthyosaurus was formed to dash through its stormy waves, and reign the despot of the "ocean stream." At the bottom of this sea, blue clay was now deposited, with occasionally some carbonate of lime, forming the lias, in which has been preserved many a relic of these creatures of the past, to tell us who and what preceded us in the habitation of this globe of earth. After the formation of the lias there elapsed another enormous interval, measured by the deposition of the remainder of the secondary and the whole of the tertiary formations, during which that which is now the county of Leicester,

* Some portions of the red marls exist on the flanks of Charnwood Forest, at a height considerably greater than their general level; their position, however, may I think be easily accounted for, if we reflect that in a sea with an uneven bottom, and in which depositions from above were taking place, some portions of the sediment might in favourable situations be retained at much higher levels than the general beds.

remained undisturbed by convulsions from below, and as far as we can tell, augmented by depositions from above, until a comparatively most recent period; when water exercising a degrading and denuding power, acted on the previously formed rocks, broke off pieces of them, and after washing them about in strong currents, till they were rounded into pebbles, broken down into sand, or ground into clay, has left the materials thus accumulated strewed irregularly over the surface. What was the character of these waters, whether they rushed as strong floods over previously clay land, or whether they were currents caused in a sea by the elevation of its bed, I shall not pretend to determine, though my own opinion leans to the latter supposition. At all events, ever since the accumulation of those loose materials to which for convenience sake the term diluvium is attached, Leicestershire, in common with the rest of England, has remained permanently uplifted above the level of the sea, unchanged save by the slow and silent action of the atmosphere, or in these our days by the trifling scratches inflicted by the hand of man.

The science of Geology is sometimes regarded by practical men as a mere mass of theory from which no results can be derived useful for practical purposes: in any operations, however, connected with the mineral matters of our globe, it surely never can be supposed a useless thing to know the causes which produced them, and the forces of disturbance which have acted on them, since from such knowledge alone can we tell, previously to actual experiment, the probable character and position of the matters in question. In this respect, too much is sometimes required of Geology in its present state; the science is the creation of the last few years, and already has it accumulated a vast amount of information respecting the structure of those parts of the earth which are accessible to our investigations, that will for ever preclude the recurrence of many wild and ruinous undertakings in search of coal and other minerals, that have formerly been blindly set on foot. New facts are every day gathered together, and the science is fast approaching the condition when it will be enabled to bring most powerful aid to many operations that are useful or necessary to our existence, that administer to our comfort and enjoyment, or that augment our individual and social powers and resources. It must, however, be borne in mind that all these are but means to an end, that end being the elevation of ourselves in the scale of moral and intellectual existence, and that independently of all other considerations. Geology directly and most powerfully conduces to this

end, by spreading before us whole regions of new space for the exercise of our moral and intellectual faculties.

As a few practical questions, however, I may state—1st. It is probable that the Ashby coal field is continued beneath the red sandstone to the west and south, but at too great a depth to render its working practicable, for the present generation at least. 2nd. It is improbable that coal exists in the eastern portion of the county, or there would be some of the rocks connected with it at the surface, somewhere on the east or south of Charnwood Forest; the elevation of the forest rocks having taken place after the formation of the coal strata, and the line of that elevation running from north west towards the south east. 3rd. It is not improbable that rock-salt should be found in the south east of the county, in the upper portion of the new red sandstone, as a salt spring exists at Shearsby.

There are many minor practical points in which a knowledge of the geological structure of the country would be useful, but which would require more minute details.

DIVI BOTANICI;

SKETCHES OF BOTANISTS WHOSE NAMES ARE COMMEMORATED IN THE APPELLATIONS OF PLANTS.

Article the Second.

Linnæus exercised a delicate and judicious discrimination in his adoptions of botanical names which perpetuated the reputation of personages by whom, in early times, the investigation of plants had been advanced or encouraged. Feeling conscious of his own qualifications, and asserting his well-established right, to administer the office of a phytological lawgiver, the "Immortal Swede" promulgated Rules* for limiting the practice of honorary "denomination"

* These Rules, with many equally good ones besides, stand clearly defined by Linnæus himself, in the excellent work which contains an exposition of his phytological principles—his *Philosophia Botanica, in quâ explicatur Fundamenta Botanica cum definitionibus partium, exemplis terminorum, observa-*

when appropriated by himself, and for directing his disciples in assigning the highest distinction in their science to its most active and eminent votaries. These Rules derived beautiful characters from the Legislator's enlightened imagination, and especially from

tionibus rariorum, adjectis figuris: 8vo, *Holmiae*, 1750, and numerous subsequent impressions. It was translated into Spanish by Don Antonio Capdevila; 8vo, Madrid, 1771; and into French by F. A. Quesné; 8vo, Paris, 1788, which is, in the opinion of a French critic, "an imperfect, though respectable, version of an almost untranslatable book." The Linnæan Rules for Nomenclature are translated and freely discussed by Dr. Colin Milne, in his *Botanical Dictionary, or Elements of Systematic and Philosophical Botany*, forming a complete System of Botanical Knowledge, for the use of Students in that Science; 8vo, London, 1770, 1777, 1805. This is a very convenient and useful "system;" and, with its successive improvements, is well calculated to facilitate the researches of naturalists, as they explore the constitution of the Vegetable Kingdom and the relative adaptations of its elements. Dr. Milne's dictionary is very comprehensive, but concise and perspicuous. It contains descriptions of the parts of plants; an explanation of the scientific terms used by Morison, Ray, Tournefort, Linnæus, and other eminent botanists; a brief analysis of the principal systems in Botany; a critical inquiry into the merits and defects of the Linnæan method of arrangement; sketches of the natural families of plants, their habits and structure, virtues and sensible qualities, and economical uses; an examination of the doctrine of the sexes of plants; and a discussion of several curious questions in the vegetable economy connected with gardening. Five years afterwards, Mr. Hugh Rose, of Norwich, prepared a pure English version of the entire original Treatise of Linnæus; and, in terms of great modesty, he submitted it to the acceptance of "those who are fond of the study or fashionable amusement of practical Botany which, with him, "consists in the definition, disposition, and denomination of plants." His book bears the title—*The Elements of Botany:* containing the History of the Science, with accurate definitions of all the terms of art exemplified in eleven copper-plates; the scientific arrangement of Plants and Names used in Botany; and Rules concerning the general history, virtues, and uses of Plants; being a translation of the *Philosophia Botanica* and other treatises of Linnæus: to which is added an Appendix, wherein are described some Plants lately found in Norfolk and Suffolk, illustrated with three additional copper-plates, all taken from the life: 8vo, London, 1775. Mr. Rose's *Elements of Botany* might be advantageously revised and enlarged, so as to support the exquisite System whose principles they disclose with unusual faithfulness and effect. The nomenclature of this system is ingeniously artificial; but, whether it be designated the *Linnæan* or the *Sexual*, it possesses as many natural features at least as the *Natural* Arrangement by which, with an excess of wordy effort, it is now so much the fashion to desire that it may be supplanted. Verily, the latter has its merits, and let these be fully acknowledged: yea, let high praise be the meed of its sesquipedalian beauties; but let not this exceed what is just, and thus be a great deal too *honorificabilitudinitacrous!*

the perfection of his judgment matured by experience. He enjoins, with manifest propriety, that, in Botany, generic names should not be abused by conferring them on saints or men renowned in any other art or science, in order to prolong the remembrance of such persons or to court their favour; from the certainty that, with regard to the former, the greatest of such saints were generally the grossest sinners: that the generic names borrowed from the fables of ancient poets, or from the fabulous designations of their heathen deities, who originally were illustrious mortals, for the reason that these names commonly had reference to the exercise of some good disposition or to the result of some beneficent action: that the appellations consecrated to the memory of kings, princes and great men, who have promoted the knowledge of Botany, deserve to be retained: and that the generic names made to commemorate the merits of excellent botanists, universally ought to be held sacred; for, as this is the only and the best reward of their labours, it should be viewed with reverential estimation, and dispensed to those solely who have effected valuable improvements in Botany, that others may be thereby induced to cultivate and adorn the science.

From a remote period in the History of Herbs, the plant Musa obtained its name from a modification of the term by which it was popularly known in those intertropical regions where it grows, indigenous and abundant; but, in harmony with the foregoing Rules, and without change in the orthography, this appellation was expressly determined by the authority of Linnæus himself, that it should be, in his System, the memorial of a "great man" who endeavoured "to promote the knowledge of Botany" by explaining the qualities of a salutary vegetable, and to extend the benefits of medicine by imparting an extraordinary contribution to its resources. Now, this justly honoured individual was

Musa *the Physician.*—Habitually animated by the insatiable spirit of Democracy, the Rulers of the Roman Republic intuitively approved and zealously promoted the inherent selfishness and ferocity of a Sovereign People, by the device of ordinances for perpetuating a system of the most cruel and iniquitous despotism—the despotism of Slavery,* with all its atrocities and diabolical abomina-

* With powerless or pennyless declaimers, it has long been the unworthy custom to revile the memory of Julius Cæsar, the dictator, with loud and liberal abuse, as the extinguisher of his country's liberties. Nevertheless, it was this celebrated personage, alike distinguished as a soldier, a statesman, and a scholar, who exercised a high moral intrepidity in modifying the injus-

tions. During the lapse of many ages, these sagacious and venerated barbarians persevered in maturing the practice of enslaving every alien nation which their fierce and sanguinary armies were able to ruin and despoil of its independence. This system of outrage on the divine institutions and on the natural rights of men was designed to increase the opulence and power of the oppressor; but, like every other national enormity, it conduced with slow but certain influence to aggravate the bane of rottenness and depravation to which even the strongest constructed tyranny is necessarily exposed. From this state, unusual merit occasionally redeemed a captive and raised him to the humbling rank of being respected as the "freed man" of his enslaver, with a right to the chance of gleaning some reputation or property in the applications of his skill and experience directed by a good mental endowment. Such was the fortune of Antonius Musa, who gained the high office of "Archiater to Augustus," and received the meed of a deification from the chief priest of Botany, in after-days, with an immortality greatly more exalted than that which was bestowed by vassals and parasites on his imperial master.

Historians and traditionary chroniclers, and the poets also, are all equally silent concerning the native land of Musa, the places of his education, and the circumstances of his captivity. He is sometimes represented as a Greek by nation; and, if this statement has a sure foundation, he must have fallen a sacrifice to the rapacity of those ruffians by whom the last germs of Grecian freedom were trampled in the dust. His possession of "useful knowledge" and his attainments in philosophy would render him an object of desire to the wealthy or ambitious; and, in consequence of his worth, he was preferred by the august "slave-owner" to whom the "liberal" Roman citizens submissively entrusted the absolute guardianship of their "civil and religious liberties."

tice of that republican law which sanctioned and sustained the despotism of slavery. He it was, while magnanimous patriots all around him were stunning Rome with noise of virtuous cant, though hatching secretly a deed of murder, he alone it was, who offered a generous homage at the shrine of Intellect, by proclaiming liberty to the enlightened captive. History relates, with grateful approbation, the fact that Julius Cæsar conferred the freedom of the city on all those who practised the medical profession, and on those who taught the liberal arts, as an encouragement for these persons to establish themselves in the capital, and for others to desire the privileges of Roman citizens. Cæsar merely concentrated the sordid tyranny of the Many into the arbitrary sovereignty of the Few. His successor gave peace to the world for half a century, and prosperity to his many-peopled dominions.

Antonius Musa appears first on the page of Biography, as the freed-man of Augustus, and the physician who instituted a new kind of treatment for the recovery of that potentate, from a dangerous sickness. Pliny "flourished," not many years after the demise of Augustus, about the middle of the first century; and, from his rank as a soldier, a senator, an augur and a provincial governor, in which the "admirable naturalist" was engaged during his short but meritorious life, he had access to accurate information regarding his statements of circumstances connected with the imperial court and its most distinguished members. He particularizes two occasions* whereon the "servile physician" prescribed remedies which produced the happiest results. Speaking of the Lettuces, their virtues and kinds, he says in Dr. Holland's English, to "say a truth, all Lectuces† are by nature refrigerative, and do cool the bodie, and

* When speaking of "Vetches and Eruile," another illness of the Emperor is mentioned by Pliny, besides those which were treated by Musa with Lettuces and cold applications. "As touching Eruile," he says, "it asketh no great hand or trauell about it: yet thus much more attendance it requireth than Vetches, for that it must be weeded and grubbed about the roots. Besides, this kind of Pulse is of great vse in Physick; for Augustus Cæsar was cured of a disease that he had, and recouered his health by means of Eruile, as himselfe reporteth in some of his letters now extant. Moreouer, fiue pecks of Eruile sown, is sufficient to maintain and find a yoke of oxen: as for that which is sowne in March, it is hurtfull forage for kine and oxen, as also that which is sowne in Autumne maketh beastes heauie and stuffed in the head, but that which is pvt into the ground in the beginning of Springe is harmless.—Holland's *Plinivs*, I, 572. "As touching Eruile and the properties thereof," Pliny recapitulates and enlarges his account of them at vol. ii. p. 143, and his very curious description concludes with the remark —that "the green cods of Eruile before they waxe hard, if they be stamped with their stalkes and leaves together, do colour and die the hairs of the head blacke;" 'for that colour,' it is added by Dr. Holland, quoting Alexander ab Alexandro, 'in old time, was best esteemed, and thereby chaste matrons were knowne from wanton harlots, who affected yellowe haire."—*Genialium Dierum Libri Sex*; lib. v, cap. 18; folio, Romæ, 1522; 8vo. 2 vols., Lugd. Bat. 1675.—This Ervum, Ervilla or Ervilia is a vegetable of the Vetch kind, in the Leguminous family of plants. It contains the nutritive principle for animals, in a valuable proportion; and it appears to be the herb to which Virgil refers, when he makes his poetical herdsman exclaim—"*Eheu! quam pingui macer est mihi taurus in ervo*," where the Bull represents a herd of cattle, and the Vetch stands as the symbol of a pasture-field rich in nutrient herbage.—*Bucolica; Ecloga* iii, *v.* 100.

† *The Historie of the World, commonly called the Natvral Historie of Caivs Plinivs Secundvs*; translated into English by Philemon Holland, M. D. folio, 2 vols. London, 1634; Tome the second, p. 24. *Caii Plinii Secundi Historia Naturalis*: folio, 3 vols. *Parisiis*, 1723, *cum commentariis Harduini*;

therefore be they eaten ordinarily in summer; for they please the stomacke when it is inclined to loath meate, and procvreth appetite. Certes, reported it is of Augustus Cæsar, late emperour of famous memorie, that he escaped a dangerous disease, and was recouered by the meanes of Lectuce whereunto he was directed by the discreet counsell of Musa his physician."

When Augustus was suffering from another severe attack of disease, and immersion in hot baths had failed of relieving him, directions were given by Musa in concert with his brother Euphorbus, who also was a physician, to have the person of his illustrious patient freely subjected to the action of cold water in the form of ablution or affusion; according to the method, as Pliny* has it, of Musa

lib. xix. *capiti octavo.* Here, the Naturalist describes several kinds of Lettuce; but, he observes, " the round kinde with smallest root and broad leaues is called *Astylis*, the chaste or ciuil Lectuce, howbeit some giue it the name *Eunuchion*, because of all others it cooleth most the desire of dalliance, and is an enemy to the sports instigated by the divinity to whom the myrtle was sacred." In a marginal note, Dr. Holland slily refers to Rhodiginus, and says—" Let him tell you why this Lectuce is called *Astylis*, by the women."—Ludovico Celio Richeri *(Rhodiginus)* was a learned Italian critic and commentator: he was born about the year 1450 and died in 1525: his work is intituled *Lectiones Antiquæ;* folio, Venetiis, 1516; Basileæ, 1566; Francofurti, 1666. Nearly two hundred years ago, Vossins expressed astonishment that a work so truly valuable should be so little known. Notions similar to those recorded by Pliny concerning the properties of Lettuce were entertained by Dioscorides and Theophrastus, by Callimachus and the poets, by most of the Arabian doctors, and by the earlier European herbarists. Quite generally, the patrons of " vegetable medicine" are eloquent in attributing to this plant an inherent power to over-rule the first and frailest of the phrenological propensities: but no one of the patrons ever surmises that the cause of the emperor's cure might, on their principles, also be the cause of his having no heir " of his own body begotten" to enjoy the imperial patrimony! Now, all this being true, it would appear that the " liberal" consumption of Lettuce, as an esculent endowed with sobering qualities, might deserve the countenance of Malthusian economists, and also prove not altogether unworthy of a " Regulation" subservient to the peripatetic philanthropy of the Poor Law Commissioners.

* *Historiæ Naturalis, Libri* xxv, cap. vii.—Another section of this immortal work exhibits an edifying illustration of the disingenuous selfishness with which the discoveries of science are too often beclouded by vain and shallow pretenders to originality. Although, with the co-operation of his brother, Antonius Musa had methodized the " *Psychrolusian System,*" and made its efficient administration the means of restoring health to the most exalted personage then living; nevertheless, this system was revived by Charmis, a " talented and intellectual" prescriber, with the ostentation of a new discovery, after being neglected at Rome for nearly half a century on account of

and his brother, who "*instituere a balineis frigidâ multâ corpora adstringi,*" enjoined the bodies of invalids to be braced with copious applications of cold water, in or at the baths. Under this discipline, the case was conducted to a favourable termination, and the fruits of the doctor's "heroic remedy" were—the emperor's favour with munificent largesses, and honours in profusion.

As sketched by Suetonius,* this "medical transaction" and its results are instructive. He relates—that, throughout a long life, Augustus was subject to frequent and dangerous accessions of illness which often occurred annually, on his birth-day. His constitution became, in consequence, so greatly shattered as to require unceasing attention to his health, by suitable arrangements of diet, exercise, dress and regulated temperature. At his return from a Cantabrian expedition, he was afflicted with a disorder of the liver depending on congestion; and, on his despairing of recovery, he submitted to be treated by the system of Antonius Musa, which was then reckoned both hazardous and extraordinary. Hot fomentations† "*calida fomenta,*" having been used without advantage, by

its being felt an uncomfortable remedy, by the luxurious and degenerating citizens. Pliny's chapter on "Physicke and Physitians among the ancient Romanes" includes a lively sketch of this "medical gentleman," as one of "these new commers that can venditate and vaunt their owne cvnning with braue words." Thus, says the Natural Historian, while the astrological doctors seemed to command the destinies and to have men's lives at their disposal, "all on a sudden, one Charmis, a Marsilian, pvt himself forward and entred the citie of Rome, who not onely condemned the former proceedings of the ancient Physitians, but also pvt downe the baines and hot houses: hee brought in the bathing in cold water, and persuaded folke to vse the same euen in the middest of winter: nay, he feared not to give direction vnto his sicke patients for to sit in tvbs of cold water: and I assvre you my selfe haue seen ancient senatovrs, such as had been Consuls of Rome, all chilling and quaking, yea and starke againe for cold, in these kind of baines; and yet they would seeme to endvre the same, to shew how hardie they were: and uerilie there is a treatise extant of Seneca where he approues highly of this covrse. Neither is it to be doubted, but such Physitians as these, who hauing won credit and estimation by svch nouelties and strange deuises, shoot at no other marke bvt to make merchandize and enrich themselues euen at the hazard of our liues, and herevpon come these lamentable and wofull consultations of theirs abovt their patients."—*Ib, Book* xxix, chap. i, Tome ii, p. 345.

* *Caivs Svetonivs Tranquillvs, ex recensione Iohannis Georgii Grævii, cum notis Isaaci Casaaboni, Lavini Torrentii, Theodori Marcilii et aliorum:* 4to. *Trajecti ad Rhenum,* 1691; Lib. ii. sect. 59, 81; p. 215, 249.

† Fomentations, *fomenta*, consist in quickly repeated applications of a fluid to a circumscribed portion of the invalid's person. Anciently, as now, they were warm in most instances; but Suetonius here, and Pliny also, are

the counsel of other physicians, Musa caused them to be discontinued—substituting cold fomentations, whereby a cure was happily effected. With seeming gratitude for this achievement, but not without adulation of a liberal despot, a servile senate conferred on the emancipated healer of Augustus the distinction of having a statue of brass consecrated to his honour, and erected beside that of Æsculapius, whom the Roman people reverenced by the institution of divine rites and a devoted worship.

Dion Cassius communicates additional notices* relative to the fortunes of Musa, his "method," and his medical as well as civil preferments. Thus, when sinking under an inveterate disease, Augustus had renounced all hope of recovery, and made final arrangements with a view to his impending dissolution; and when he was unable to follow the course held to be indispensably requisite; Antonius Musa restored him to health with the use of cold lavations or ablutions, and cold potations or drinks. For this important service, the physician received ample pecuniary rewards,† both from his patient and from the senate: the privilege of wearing a gold ring‡ *(for he was a freed-man)* was also conferred upon him; and he obtained exemption from imposts of every kind, not for himself only, but for the

explicit in stating—that the remedial means prescribed by Musa were *frigida*, cold; and that they were *fomenta*, fomentations with cold water, distinguished clearly from *balneum* or *balineum*, general immersion in a bath. The "cold affusion" might have been employed in this case; or, probably it was treated with local sponging with the liquid at the cool or cold temperature.

* *Cassii Dionis Cocceiani Historiæ Romanæ quæ supersunt, curante H. S. Reimaro, græcè et latinè; folio, Hamburgi*, 1750; vol. i., p. 724—5.

† *Sestertium Quadringenties*, a bountiful Honarium! but, to determine here its precise amount in sterling pounds, would be to withdraw a pleasant exercise from the reader's calculating faculty.

‡ The "*usus annuli aurei*" was a patrician privilege; it constituted the ornamental badge of nobility. Musa received this honour as a token of the Emperor's gratitude; and, out of respect to this physician, the right of wearing a gold ring was extended to members of the medical profession. Such a gewgaw, fair emblem of "Routinity," still occupies the place of an appendage to the garniture which deciphers the attainments of a "medical gentleman." Among the Roman institutions, there was a particular census which enjoined the rule, that a person must be a gentleman whose father and paternal grandfather possessed property worth £3229 3*s.* 4*d.* before he could claim the privilege of wearing a gold ring, or become an aspirant for the patent of nobility. Pliny instructed his countrymen in the "literature and science" of rings and coronets, in the first and second chapters of the thirty-third book of his *Natural History*. See also Arbuthnot's elaborate *Tables of Ancient Coins, Weights, and Measures, explained and exemplified in several Dissertations*; 4to, London, 1727, p. 176.

whole medical profession, in all time coming. Having related these facts, Dion strangely adds, with reference to the honoured physician, "but, it is right that he should be exposed who could arrogate to himself the work of fate and fortune: and so it happened that although Augustus had been recovered, yet when Marcellus* soon afterwards fell sick, the youth died notwithstanding he also was treated by Musa's method." Manifestly, however, this is a childish and unjust imputation; for, if Musa changed the previous to a contrary treatment; and if, under this treatment exclusively, the emperor was soon brought to health from "the gates of death;" then, by simple equity, the treatment and the cure ought to be regarded as cause and effect, while the merit of this should justly be ascribed to him who directed its cause, and not to "fate and fortune," inasmuch as he incurred the risk of its discredit, if he had proved unsuccessful.

By the same historian it is stated that, in certain quarters, Livia was charged with having procured the death of Marcellus, by poison; but it is stated further, this suspicion was rendered questionable by the fact that, for two years, the seasons had been so unwholsome as to generate diseases which proved fatal to a great multitude of persons. These diseases seem to have constituted an epidemic, with appearances resembling modifications of the Cholera, according to their general descriptions.

* Taken altogether, Virgil's *Æneid* is a complete and splendid Panegyric on Augustus, and with this the poet dexterously mingles complimentary episodes in honour of his patrons and most valued friends. His elegiac verses on Marcellus have always met with universal commendation, for the delicate eulogy and affecting sentiment with which they are imbued. This accomplished prince was the son of Octavia, the sister of Augustus, who had adopted his nephew with the intention of bequeathing to him the imperial wealth and the Roman sovereignty. Marcellus married Julia, the emperor's daughter, who was soon thrown into widowhood by the sudden demise of her husband, in the eighteenth year of his age. His premature death occasioned great and unfeigned lamentation: and, for celebrating his virtues, the poet was rewarded with the most princely favour and munificence. When Virgil was reading his pathetic episode to Octavia with the sweetness, propriety and grace which distinguished him, the princess became intensely affected and shed abundance of tears; but, on finding the beautifully mournful panegyric appropriated to her son, whose name remained judiciously unmentioned till the close, she was overpowered with the "joy of grief," and sunk into a swoon. On recovering a little, Octavia ordered ten sesterces —upwards of eighty pounds sterling—to be given to the minstrel for every one of the twenty-seven verses which have immortalized the excellencies of a son whose melancholy destiny she deplored.—*Virgilii Æneidos, lib.* vi, v. 860—886.

After the manner of refined nations, the Roman court-physicians would enjoy the honour of prescribing for the more fanciful or fashionable of the courtiers; and so it was with Antonius Musa, who had Horace and Virgil for his patients, with the enjoyment of their confidence and affection. Addressing himself in an epistle to his friend Numonius Vala,* the former of these exquisite polishers of verse and manners mentions the circumstance as a novelty, that Antonius Musa had directed him to discontinue bathing in the warm springs of Baiæ as incapable of removing his disorder, and in their stead to use cold ablutions freely, even in the depth of winter. Virgil too has bequeathed to posterity a beautiful testimony of his esteem for Musa, enlivened with enthusiastic admiration of the virtues and excellencies that adorned his character. "Never," proclaims the Mantuan bard,† "never shall I meet with a man more estimable than Musa, or more amiable. Endowed with the best boons bestowed by the gods and givers of inspiration, surpassed he is not in love for the tuneful lore, nor in the enjoyment of all exquisite knowledge. Ever shall it be appreciated my greatest happiness to be beloved by Musa, the object of my devoted affection."

From the same inimitable poet, whose refined taste was always directed by the soundest judgment, Musa received another most elegant freewill-offering at the shrine of friendship, in being personated by

* *Horatii Flacci Epistolarum, lib.* i, *Epist.* xv, *v.* 2—5.—From this epistle, it would appear that the liberal gentry of Baiæ were dissatisfied with Horace for preferring the advice of Antonius Musa to that of the "Spa-doctors" with their pleasant practice of bathing in thermal springs. He therefore determines on removing from the place; and, knowing the climate at Gabii and Clusium to be too cold in the winter, he requests his friend Vala to answer the questions—is the winter genial at Velia and Salernum; is the air healthy: what sort of people are the inhabitants; which is the readiest way to go thither; which of these two places abounds most in corn; how is their water; is it kept in cisterns, or are there plenty of wells; do hares and boars abound in these places; are the seas well-stocked with fish; have they plenty of cray-fish? As for the wine, be it good or bad, it will concern me little; to my taste a generous Grecian wine is the best; it drives away care, and inspires the heart with hope and gladness.—These precautions of the poet's may prove useful to unailing invalids, who sometimes happen to be particular in "engaging lodgings" at the watering places.

† *Publii Virgilii Maronis Opera, cum integris commentariis Servii, Philargyrii, Pierii; accedunt Scaligeri et Lindenbrogii notæ ad Culicem, Cirin, Catalecta; ad Codicem M. S. regium Parisiensem recensuit Pancratius Masvicius; 2 tomis, 4to, Leovardiæ,* 1717; vol. ii, p. 1307. Virgil's Epistle to Antonius Musa is one of the "Catalecta;" and, says Scaliger, it shews that this physician was a person *elegantissimi et politissimi ingenii* in the poet's estimation.

Iapis,* who treated the arrow-wound inflicted on Æneas, by an unknown hand in the fierce conflict which terminated the Lavinian war. When the hero was disabled by this accident, his attendants supported him, as he retired from the field to his tent, leaning on his long spear. Here, the anguished prince was received with prompt and dutiful solicitude by Iapis who forthwith entered on the operations requisite for the cure of the wound. On this occasion, however, the Healer's skill and zeal are unexpectedly thwarted by supernatural interference; for the gods had agreed that a miracle should confer a divine lustre on that scene which was to complete the beginning of the Latin name, and its glorious destiny. Whether therefore it be considered as a description of some ancient chirurgical usages, as an illustration of the styptic powers ascribed of yore to the Cretan Dittany,† or as expression of the poet's affectionate gratitude to his pious and illustrious friend, this instructive episodic scene merits unusual regard from the admirers of recondite and archæological investigation.

Among the earliest notices of Medicine, historical or traditionary,

* *Virgilii Æneidos, lib.* xii, *v.* 391—429.—All his writings shew that the principle of friendship glowed in the mind of Virgil with a pure and inextinguishable fervour; and the evidences which prove that he designed to frame an acceptable character of Augustus in the one he assigns to Æneas, are equally applicable to the conclusion, that he was desirous of honouring his favourite Musa—*ante alios carior, dulcior, doctior, jucundior*—by the amiable and excellent personal as well as professional attainments he ascribes to Iapis in the admirable episode where this generous and enlightened physician is introduced. Who was the prototype of Virgil's Iapis? As a proposition, this is discussed with great ingenuity to a regular consequence, by Bishop Atterbury, in an essay intituled *Reflections on the Character of Iapis in Virgil; or the Character of Antonius Musa, Physician to Augustus:* it forms one of the bishop's miscellaneous tracts, and is inserted in Warton's edition of the Works of Virgil; vol. iv, 257—276. Iapis means generally the *Healer:* it is a poetical term constructed from the Greek verb Ἰάομαι, *medeor*, to heal, to cure diseases and wounds: from the same source are derived Ἰατρὸς, *medicus*, a physician, and *Archiater*, the "physician in ordinary to the king," emperor, or sovereign of a state.

† This is the *Origanum Dictamnus* of the Linnæan system. From the remotest antiquity, both gods and men held this plant in the highest estimation as an infallible vulnerary, from its reputed powers of restraining hæmorrhage and hastening the cure of wounds. Gathered on Mount Ida, and conveyed with divine velocity, the Dittany formed a prime ingredient in the panaceated fomentation prepared by the "Goddess-mother," and charmed by her into the inconscious hand of the Healer, who discovered its source by its effects, and piously acknowledged the miraculous energy.

there are facts which support the belief that the flesh of Vipers was freely administered as an effectual remedy for the leprous, scorbutic, scrofulous and similar affections resulting from a degenerate constitution. Antonius Musa had recourse methodically to the same expedient, with astonishing success in the treatment of Ulcers which were deemed incurable: "that renowned physitian," says Pliny,* "having certain patients in cvre vnder his hand, for svch he prescribed them to eat Vipers' flesh, and wonderfull it was how soon he healed them cleane by that means.' At Rome among an inquisitive people, this method would naturally produce the effect of an extrordinary innovation; but, with the physician to whom it was peculiar, it must have emanated from his profound reflection on the experience of those barbarous tribes who regale themselves with the flesh of Vipers as an exquisite aliment. By its proper qualities, combined with the nutrition of fibrous structure, it exerts invigorating influences on the animal economy: it quickens the circulation of blood and the nervous energy, purifies the secretions, increases perspiration, and thus improves or renovates the constitution: so thought the doctors, of old.

This practice of Musa's was resumed by Galen† and Aretæus, about two hundred years afterwards; and, to very recent times, it has been in use under various modifications. Nearly cotemporary with him, was Craterus, an Athenian physician, who, according to a

* Holland's *Plinivs' Natvral Historie*, the thirtieth Book, chapter xii.; voll. ii. p. 394.

† There is an amusing if not edifying natural and medical history of the Viper, with illustrations from ancient and modern authorities in the "*History of Four-footed Beasts and Serpents*; interwoven with a curious variety of historical narrations out of the scriptures, fathers, philosophers, physicians and poets; collected out of the writings of Conrad Gesner and others, by Edward Topsel; folio, London, 1658; p. 799—810. In the volume of his immense Natural History, which contains his "*Serpentum et Draconum Historæ libri duo, folio, Bononiæ*, 1640," Aldrovandi has a comprehensive chapter on the Viper; and in this, he treats of the Reptile's various names, synonymes and their etymology, kinds and diversities, figure and description, physionomy and anatomy, nature and propagation, sympathy and antipathy; the situations it haunts; its food and temperament; methods of dislodging and capturing it; peculiarity of its poison and the symptoms it produces, with the remedies; treatment of cattle bitten by the viper; precautions against its venom; its epithets and appellations; moral drawn from its habits; proverbs and miracles connected with its history; its use in hieroglyphicks, coins, emblems and symbols; its employment in "phrenoschemes;" its monstrosities; its figurative representations; and its uses as food and physic, and in the composition of drugs: p. 108—167.

relation of Porphyry's,* accomplished the cure of one of his servants by directing him to use the flesh of Vipers dressed as fish, for his ordinary food. It is stated by Lopez† for a fact to which he accords his belief, that the people of Congo esteem the Viper as a most delicious article of food: they prepare it by roasting, and devour the viands with a gluttonous zest. From a perfect acquaintance with its qualities, the natives of Tonquin‡ are accustomed to regale their friends with arrack wherein the bodies of Snakes and Vipers are infused. No long period has elapsed since the physicians of France and Italy were in the habit of prescribing broths and jellies composed of Vipers' flesh, for the purpose of purifying the blood when tainted or exhausted by diseases. Now, if the virtues of these reptiles when prepared for food or medicine, are strengthening and restorative, why should they be disused as a remedy? Who knows that the scrofulous poison could not be extinguished with liberal draughts of a generous "Viperine wine?"

Musa enjoys the reputation of a medical botanist, derived from the singularities of a tract on the properties of the Herb Betony§ and it applications. Very reasonable grounds are assigned for bestowing the merit of this production on the imperial physician, but it

* *Porphyrius: De Abstinentâ ab Esu Animalium, græcè et latinè;* 8vo. *Cantabrigiæ*, 1655. Craterus was physician to Pomponius Atticus, the friend of Cicero, who speaks of him with great respect in his correspondence. *Letters to Atticus;* Book xii. Epist. 13 and 14.

† *Reporte of the kingdom of Congo, a regione of Africa;* drawen out of the writinges and discourses of Odoardo Lopez, a Portingall, by Philippo Pigafetta; translated out of Italian, by Abraham Hartwell of Cambridge, 4to. London, 1597.

‡ This account rests on the authority of Dampier, in his Voyages, and on that of other travellers who had acquired a knowledge of the Tonquinese customs, by personal observation. Many interesting particulars relating to the country and its inhabitants will be found in the work of Alexander de Rhodes, bearing the title, *Tunchinensis Historiæ libri duo;* 4to. *Lugduni*, 1652; or in its French translation by Henry Albi, published at the same place in the same year; or in the work of Tavernier's translated by Edmund Everard and intituled "*Voyage to Tunkin and Japan, with figures;*" folio, London, 1680; or in the same author's original "*Voyages en Turquie, Perse et aux Indes,*" 3 vols. Paris, 1679.

§ Some chroniclers will have it, that Apuleius the phytologist could be no other person than Apuleius Celsus, a physician nearly cotemporary with Antonius Musa: others argue that the herbalist was himself the identical Apuleius of Madaura who composed, at a period later by one hundred and fifty years, the famous *Golden Ass* with its magical fictions; and, it is to such an Apuleius, that certain bibliographers would transfer the merit of

has also been conferred on Apuleius* the phytologist, whose Book on the Medical Virtues of Vegetables it frequently accompanies. Hence in modern times, has arisen a bibliological discussion attended with a display of erudite argumentation, unencumbered with the shew of one single fact, for maintaining as well as resisting the pretension, that the monograph "*De Vetonicâ*" was composed by Apuleius, whose distinct personality remains undetermined. Could, however, the writing be fairly disembarrassed of the blemishes, improvements or ornaments imposed upon it by successive transcribers, it would be found not destitute of appearances confirming the probability of its having originally been an epistle, the result of a recreative exercise, addressed by Musa to Marcus Agrippa, the son-in-law and heroic friend of Augustus, and truly patriotic favourite of the Roman people.

Musa's *Herba Vetonica* is the Wood-betony; and, in his mind, it possesses energies available in the treatment of forty-six different diseases. Hence came the Italian compliment "*ha più virtù che Bettonica*," you have more virtues than Betony; and hence the adage, "*vende la tonica é compra la Bettonica*," sell your coat and buy Betony. Until fashion had inspired a taste for occult and outlandish

having aspired to describe the Betony and its salutary properties. Between the Monograph on Betony, however, and the Apuleian Herbal with its cxxviii plants, there is this essential and characteristic distinction—that the former consists of simple and precise directions harmoniously accordant with the spirit and experience of the times when Musa was eminent as a physician, while the latter has its precepts entangled with the rubbish of many superstitious injunctions.

* Pliny's praises of Betony, in the style of his translator, are tinctured with extravagance, the offspring of a benign credulity. "Surely," he says, "an excellent herb this is, and aboue all other simples most worthy of praise. The leaues brought into pouder, be good for many vses: there is a wine and vineger condite with Betony, soueraigne for to strengthen the stomack and clarifie the eiesight: this gloriovs prerogatiue hath Betony, that look about what hovse soeuer it is set or sowed, the same is thovght to be in the protection of the gods, and safe enovgh for committing any offence which may deserue their vengeance and need an expiation or propitiatory sacrifice." *Natvral Historie*, Book xxv, chap. viii.—Musa's Tract, "*De Herbâ Vetonicâ, deque nominibus ejus et virtutibus*," has been often published in medical collections, as that of Albanus Torinus, folio, *Basileæ*, 1528 and 1549; that of Gabriel Humelbergius, 4to, *Tiguri*, 1537; that with the title "*Medici Antiqui Omnes*," folio, *Venetiis*, 1547; and that of J. C. G. Ackermann, 8vo, *Norimbergæ*, 1788, in which it is made the first chapter of Apuleius' *Phytography*. It is described in the *Bibliotheca Botanica* of Seguier, 4to, *Hagæ-Comitum*, 1740, p. 283; and in that of Haller, 4to, *Tiguri*, 1771; Tom. i, p. 63.

physic, the plant preserved the reputation conferred on it by Musa; and, for more than eighteen centuries, it has been valued for its efficacy as a medicinal agent, in the same cases as those wherein this experienced physician recommended its employment. Thirty-nine of his prescriptions are introduced into "the first printed botanical work* of any consequence or popularity in England," in the shape of a translation characteristic of the language early in the sixteenth century. They may be exemplified: thus, "agaynst feuer quartayn, thre dragmes of this powdre of Bethonie and an vnce of Baccatū laury or Bay beryes, with thre cyates of warm water, gyuen to the pacyent before the houre of his axces, heleth him wōut grefe." Likewise, "agaynst podagre, take water that Bethonie is soden in and drynke it often, and lay the herbe playsterwyse vpon the fete, it appeaseth ye payne" of gout "meruaylously as they say that haue proued it." Prolonged and various attention to the operation of this plant as a medicine and to its effects, has enabled instructed observers† to limit its exhibition, and to define the sphere of its usefulness. Tried in this way, it may now be considered as a mild, warm, aromatic bitter, which, in an electuary or infusion, acts as a pleasant alterative, tonic, or aperient, according to the form or composition under which it is administered.

Another subject engaged the philanthropy of Musa: this was an essay on the Prevention of Disease,‡ forming a sketch of the rules

* *The Grete Herball*, whiche geveth parfyt knowledge and understandying of all manner of Herbes and there gracious vertues; folio, London, 1526.—The arrangement is alphabetical.

† Dr. Charles Alston's *Lectures on the Natural History of Drugs, their virtues and doses*; two volumes, 4to, London, 1770; Vol. ii, p. 88.—Mr. William Meyrick's *New Family Herbal*, enumerating the vegetables that are remarkable for medical efficacy, with an account of their virtues; 8vo, Birmingham, 1790; p. 41.

‡ This appears under the form of an Epistle addressed to Mæcenas; it was published at Norimberg, in 1538, with a title shewing it to contain Musa's directions—*De Sanitate Tuendâ*, or the Art of Preserving Health. He wrote several books, *plures libros*; but, with exception of the two fragments previously mentioned, they have all perished amid the "ruins of empires" and the barbarities which paralysed the ancient advances of European civilization. Galen distinguished him as the best authority on the composition of medicines, and strengthens this judgment with numerous illustrative selections from works of Musa's, then existent. He was accustomed to prescribe the *Cichorium Intybus*, or Wild Succory, a beautiful and efficient herb, for diseases of the liver attended with jaundice, and his practice might still be imitated with safety and success. Another of his vegetable remedies was derived from the *Male* and *Marsh* Ferns, and he depended on its activity for

whose observance is indispensable to the conservation of health. Admonitions without end, and volumes without number, have solicited the concern of mankind for this most important study, with all kinds of earnestness and affection, ever since the days when the "Freedman of Augustus" endeavoured by the precepts of experience to preserve the vigorous Roman constitution from the depravement of an infectious and malignant luxury. Such Rules are simple and intelligible; and wise is the man who strives to repeat them with prudent firmness, so as to ensure the benefits of their habitual application. Temperance in diet, suitable garments, moderation in sleep, proper exercise, necessary amusements, with the right degree of active benevolence and of equanimity hallowed by religion—these are the everlasting elements of health and the safeguards of happiness.

Musa *the Plant.*—Naturalists have exercised a laudable industry in recording a nomenclature* of the Musa, in most dialects of the

the dispersion of visceral congestions. Pliny was conversant with the peculiarities of Musa's method; and, in Book xxvii, chapter ix, of his *Natural History*, he specifies concisely the varied intentions wherewith these plants were exhibited. "There is no vse of physicke of the Ferne-roots," he says, "but when they be ivst two yeres old; for both before and after that time, they serue for no purpose. Taken in this their season, they do expell all kind of uermin out of the guts; with honey, if they be broad and flat wormes; but in some swete wine for all the rest, whether they be round or small, so that the patient continve this drink three daies together. Both of them are very contrarie to the stomack; howbeit they purge the belly and evacuate choler, then waterish humovrs; bvt the better do they chase the forsaid flat wormes out of the body in case they be quickened with the like quantitie of Scammonie. The pouder of Ferne-roots is singvlar to be strewed vpon maligne vlcers; yea, and vpon the farcins and sores in horse necks: the leaves kill Punaises or Wallice, and a Serpent they will not harbovr; and therefore it is good for those who are to lie in svspected places, to make them pallets of Ferne-leaues, or at leastwise to lay them vnder their beds: the very smoke of them also, when they be burned, doth chase away Serpents." Here then, aged seventeen hundred years, is the prototype of Madame Nouffer's celebrated vermifuge which Louis XVI purchased for seven hundred and fifty pounds sterling—a princely oblation at the altar of pure philanthropy.

* From immemorial time, this plant has been designated *Mus*, *Muza* and *Amuza* indiscriminately, by the Arabian physicians: the Persians call the tree *Daracht Mous*, and its fruit is denominated *Mous*, in their language. Most of the appellations by which it is known in the various countries where it was first discovered by Europeans to be of spontaneous growth, are enumerated, from Oviedo 1526, Bruchard 1554, Thevet 1558, Garcias ab Horto 1567, Christoval a Costa 1578, and De Lery 1578, by Charles L'Ecluse (*Clusius*) in his *Exoticorum Libri Decem*; folio, Lugd. Bat. 1605; p. 229, 230,

lands where the plant is indigenous; and those botanists who entertain the curiosity or desire of making themselves conversant with the literature and glossography of their science, are furnished with an ample and fruitful sphere for research and experience in the polyglot denominations of this herb, and its history.

As a generic head, the Musa confers its appellation on a group of exotic vegetables which have ever been regarded with a natural partiality, on account of the grateful and exhilarating sustenance afforded by their fruits, to the inhabitants of sunny regions. This group constitutes the *Musaceous Family*, comprising four genera, the first of which includes five species—*Musa paradisiaca*, *M. sapientum*, *M. ensete*, *M. troglodítarum*, and *M. textilis*, all agreeing in the kind, but differing in the importance, of their uses and economy. The last is particularly valued for its delicate fibrous structure, from which some of the finest Indian muslins are fabricated.

With the most erudite philologers, the Musa is that vegetable which figures prominently in the genuine picture of longing, as distinguished from coveting, so well delineated by the divine limner in his scene of the Mandrakes—a sketch quite graphically descriptive of the earliest patriarchal and oriental customs. Here the distinctive epithet is significant of number and exuberance: it is *Dudaim*, a plural term denoting the Plant of plants with its fruit enclustered, refreshing and nutritive. By scholiasts on the Inspired Scriptures, this most mystical word is variously rendered—Mandrakes, Citrons, Lilies, Jasmines, Violets, Figs, Mushrooms, odoriferous blossoms, flowers of loveliness, or "amatorious philters;" and, though the first of these versions enjoys a general acceptance, yet the knowledge of this vegetable's economy and qualities shews its inadequacy to represent the *Dudaim*, to the minds of intelligent naturalists.

Instructed by observation and study during his extraordinary adventures, the indefatigable Wieland* was among the first to advo-

252, 283: by Bauhin and Cherler in the *Historia Plantarum Universalis*; folio, *tribustomis*, *Ebroduni* 1650; *Tom.* i, p. 148—141: and by Bodæus a Stapel, in his edition of *Theophrastus de Historiâ Plantarum*, *græcé et latiné*; folio, Amstelodami, 1644; p. 352—3.

* Melchior Wieland, M.D., latinized *Guilandinus*, was a native of Konigsberg, a respected physician, and an enthusiatic botanist. Having projected an excursion into Africa and Asia, for the purpose of exploring and studying the natural history of regions distinguished for the wonderful diversity, beauty and magnificence of their vegetable productions, he was captured by Algerine corsairs, and by them consigned to a tedious and detestable bondage. From this, at length he was redeemed by the divine benevolence of Gabriel

cate the probability, that the Musa with its luscious clusters might be the proper *Dudaim* which tempted Rachel to indulge the fancy of a devious imagination. Allied to this, was the judgment expressed by Job Ludolph, whose immense learning exalted his philosophy, the fruit of foreign travel and contemplation. His account of the Abyssinian* vegetable productions comprises the remarks—that "the Indian-fig, which the Arabians call *muz* or *mauz*, grows plentifully here, and a most excellent fruit it is: you shall have fifty figs about the bigness and shape of a cucumber hanging upon one stalk, of a most delicious odour and taste. They are ripe in June: near Damascus they are rare, for they require a hotter climate. These circumstances make me believe that this same fruit may be the DUDAIM mentioned in Genesis, which occasioned so much discontent between Jacob's two wives. Soon after, I observed that many learned men had lighted upon the same conjecture, though they do not give their reasons. My opinion is, that it should be some rare and pleasant fruit that could have moved the boy to gather it; yet not so much a boy

Fallopio, M. D. of Padua, whom the ransomed and grateful philophytist succeeded in the professorship of Botany, in the university of that celebrated city. His writings attest his learning and his zeal for the advancement of that science to which his best energies were devoted. His observations on the most remarkable exotic plants and their nomenclature, are embodied in his *Epistolæ de Stirpium aliquot Nominibus vetustis ac novis, quæ multis jam sæculis aut ignorarunt Medici vel de iis dubitarunt*: 4to, *Basileæ*, 1557.

* Job Ludolph stands high on the roll of eminent German philologers: he was born at Erfurt in 1624, and he died in 1704, in the enjoyment of well-merited distinction as a linguist, an antiquary, a traveller, a grammarian and an oriental scholar. He was the author of more than a dozen of curious and valuable works, among which were, an Amharic grammar, an Ethiopic grammar and dictionary, and the *Historia Æthiopica, sive descriptio regni Habessinorum quod vulgo male Presbyteri Johannis vocatur; folio, Francofurti ad Mœnum*, 1681. This interesting volume was translated into English and published, folio, London, 1682: it is illustrated with engraved figures, and the best of these is a graphic representation of the *Musa sapientum*, the Banana, here denominated "the Herbe and Fruite called in Hebrew DUDAIM, and in the Arabic language MAUZ or MUZA, the Indian figge:" and the plate exhibits "the herbe itself growing like a tree; the ripe fruite, with forty or fifty figges upon one stalke: one figge in its full proportion; and the young shootes that spring from the root of the tree every yeare." There is another tree which the traveller praises as "most excellent against worms in the belly, a distemper frequent among the Habessines by reason of their feeding upon raw flesh, and for remedy whereof they purge themselves once a month with the fruit of this tree which causes them to void all their worms."

neither, as to think it worth his while to carry home a stinking* mandrake. Besides, Rachel might have sent a servant to gather amiable flowers, that is to say Lilies, Violets, or the like: moreover, the Hebrew word seems to confirm this opinion, as being in the dual number, and thus implying a relation of more than one fruit to one and the same stalk."—The same author mentions another plant belonging to the *Musaceous* family. But, he observes, " the tree that goes by the name of *Ensete*† is not to be passed over without admiration; being like that which bears the Indian fig, two fathoms in thickness. Being half cut down, it renews itself again by means of innumerable shoots that spring again from the remaining trunk, all which is fit to be eaten; so that there is no need that the tree should bear any other fruit, it being all pot-herb of itself. Being sliced and boiled, it assuages the thirst of the common sort of people, who bruise the leaves and boil them with meal, and then eat the composition instead of a hasty-pudding." Another writer,‡ remarking on the Mandrake and its virtues, confirms the historian's opinion. He notes, that " when the Male Mandrake is ripe in July, it contains a golden coloured fruit as big as a pear-maine, which yields a whitish flat seed that affects the nose with a narcotick stuffing odour. By its hogo and fœtid scent, it must have a soporiferous nature: it is never used inwardly,

* Dr. Hasselquist remarks, that the Arabs of Galilee call the Mandrake by a name which signifies the *Devil's Victuals*, in their language.—*Travels in the Levant;* 8vo, London, 1767; p. 160.

† This appears to be the plant which Bruce, the well-known Abyssinian traveller, proposed to introduce as a species into the Musaceous family. We learn from his observations, that its fruit is disagreeably bitter in its natural state; but that, when prepared according to the fashion of the country, it makes a most wholesome and nutritious aliment, yielding a savour like the taste of cheese.

‡ This view of the question appears in a rare little Treatise, evincing a spirit of modest christian piety and bearing the title " THEOLOBOTANOLOGIA *sive Historia Vegetabilium Sacra;* or, a Scripture Herbal, wherein all the trees, shrubs, herbs, flowers and fruits mentioned in the Holy Bible are rationally discoursed of; by William Westmacott, of Newcastle-under-Line, physician; 12mo, London, 1694, p. 105—108.—Adrian Cocquius, in his learned and curious *Contemplations on the Sacred Phytology*, enters into a formal disquisition upon the same subject; and, by a systematic induction, he arrives at the conclusion—that the *Dudaim* positively does not signify Mandrakes, but is " *pomum et malum aureum*," a golden coloured apple, or apple-like fruit—a description not inappropriate to that of the Banana or Plantain-tree and its luxurious clusters. See his *Historia ac Contemplatio Sacra plantarum, arborum et herbarum quarum fit mentio in Sacrâ Scripturâ;* 4to, *Vlissingæ*, 1664, p. 190—200.

but passeth for one of the poisonous class of vegetables. Lemnius* tells us, how being seated in his study, a sudden drowsiness seized him, caused by a Mandrake-apple he had laid on a shelf." He next proceeds to shew that, in the flowers which Reuben brought home, there must have been "a delectable smell;" and then he concludes that, "for any one positively to affirm these lovely flowers were Mandrakes, is too magisterial and singular an opinion: 'tis likely the

* Lievin Lemmens, in latin *Levinus Lemnius*, relates this anecdote with due solemnity, in his remarks on the nature and properties of the Mandrakes which Rachel obtained by coaxing, "*eblandita est*," from Leah her sister: it forms the second chapter of his singular but not uninstructive book, *Similitudinum ac Parabolarum quæ in Bibliis ex Herbis atque Arboribus desumantur dilucida explicatio*; 12mo, *Erphordiæ*, 1581, with a good portrait of the author, in a wood-cut, on the title-page. There is an English version of this, intituled, *An Herbal for the Bible*; containing a plaine and familiar exposition of such similitudes, parables, and metaphors, as are borrowed and taken from Herbs, Plants, and Trees, by observation of their vertues and effects; by Thomas Newton; 8vo, London, 1587. Lemnius makes a cursory observation on the efficacy of Reuben's Mandrakes, in another production of his which is still more extraordinary. It is an elaborate treatise—*De Occultis Naturæ Miraculis*; 12mo, *Antverpiæ*, 1559—with many subsequent editions and translations. That into English is anonymous—*The Secret Miracles of Nature*; treating of Generation and the parts thereof; of the Soul and its immortality; of Plants and living creatures; of Diseases, their symptoms and cure; and many other rarities not treated of by any author extant, by that famous physitian Lævinus Lemnius; folio, London, 1658. At p. 262, the proposition is affirmed "that plants are of both sexes," and this is accompanied with the remarkable assertions, that "amongst herbs of the same species there is a difference of the sex, for there is a conjunction between them and a kind of matrimonial society, and hence it is that some plants are called the male and others the female. The Arabians say that the females will not bear without the males, the flowers and down of them, and sometimes the powder and dust, being strewed upon the females; wherefore plants that have a vegetative faculty, do send a generative force and vital spirit one into the other, and that by a secret consent of Nature and a hidden inspiration derived from the heat of the air and the sun and the generative spirit of the world." Now, to Cesalpino, 1583, and after him to Zaluziansky, 1592, is assigned the credit of being the first among the moderns to speak about vegetable sexuality: here, however, are the statements of a physician who, in 1559, discourses on the "Sexes of Plants" as on a well-known and established doctrine. Dr. Lemmens practised as a physician at Ziriczee, in Holland; but, under grief for the death of his wife, he went into the church, and died in 1568: his numerous writings are vigorous and elegant, and they enjoyed an extensive popularity. His translator, Dr. Thomas Newton was a native of Cheshire; and, in Biography, he is represented as having been a schoolmaster, poet, divine, and physician; he died in 1607: his English versions of foreign literature were numerous.

young child would be more fond of the delicate and sweet flowers of the field than of ill-scented and immature apples; therefore, it rather appeareth to me that he brought to his mother some other vegetable than Mandrake."

Ancient herbalists generally impute ungenial and narcotic properties to the Mandrake, with a prompt tendency, through decomposition, to become the source of ill-scented and deleterious emanations. With the Banana and Plantain-tree, it is altogether the reverse: their fruit is not less beautiful to the sight; its fragrance is more grateful to the smell, and its savour is more delicious to the taste, than that of the Mandrake. From such reasons, and others drawn from the comparative economy of these three vegetables, with the manifest inexistence of even one fact to shew that Rachel's longing for her sister's pleasant fruits was created by any other motive than admiration of their visible and sensible qualities, the conclusion is probable—that the translation which represents the *Dudaim* as a *Banana* or *Plantain-tree*, is the version which most faithfully preserves the word's original signification.

Were the Mandrakes of Reuben,* the Grapes of Eshcol, and the sweet-scented Mandrakes of the Prince's daughter, to be considered as clusters of the Plantain-tree or the Banana, the records of these would then stand for the first authentic notices of the *Musaceous* family and their delicious fruits. When the Macedonian soldiers returned from Alexander's Indian expedition, their tales of marvels concerning sights and deeds did not form an exception to the displays of pleasant fiction next to inseparable from the stories of romantic or chivalrous adventure From this source of popular information, the Greek and Roman naturalists procured the elements of those sketches of theirs which originally introduced the *Musaceæ* to a place in European literature.

Theophrastus had acquired an extraordinary consideration, as the successor to Aristotle and as an eloquent teacher of ethical science and phytology, at the time of Alexander's enterprize against the people of the east; and, having survived this magnanimous aggressor for thirty years, the physiologist had fair opportunities of procuring information from his travelled countrymen, regarding the Natural History of those kingdoms on which they had inflicted the miseries of a stern and romantic depredation. From communications thus furnished, he evidently drew the sketches of Indian trees,

* Genesis xxx, 14, 15, 16: Numbers xiii, 23, 24: Solomon's Song vii, 13.

preserved in that most ancient botanical scripture which elevates him as the Father of Phytography to the applause and veneration of all posterity. His descriptions certainly, though sketchily, represent the first defined* and the most valued of the musaceous family; and they were adopted with an enduring faithfulness and happily enlarged by the pencil of Pliny, whose philosophical concupiscence was exquisite and insatiable.

Dr. Holland's version of Pliny, Tome ii, p. 361, leads him to say, "a tree there is in India bearing a very fair, big, and sweet fruit, and thereof the sages and philosophers do ordinarily liue. The leafe resembleth birds' wings, carrying three cubits in length and two in bredth. The fruit it pvts forth at the bark, hauing within it a wonderfull pleasant iuice; insomuch as one of them is sufficient to giue four men a competent and full refection. The tree's name is *Pala*" (still *Palan* in the Malabarian dialect) "and the fruit thereof is called *ariena*. Great plenty of them is in the country of the Sydraci, the utmost limit of Alexander the Great his expedition and voiages. There is another tree like to this, and it beareth a fruit more delectable than this arena, howbeit the bowels in a man's belly it wringeth and breeds the bloodie flux," being taken to excess and without judgment. "As for the Macedonian souldiers, they talked much of many other trees, but in general tearmes only, and to the most they gaue no names at all." Similar effects still continue to be experienced by Europeans, when they indulge overfreely in using the pleasant fruitage that tempts them to intemperance, on their first visiting the climates where it is indigenous.

Next came the Arabian doctors, expatiating on the properties of the Plantain-tree and the Banana, with little regard to discrimination. Inditing his experience, Avicenna† affirms that their fruit yields

* Theophrastus leaves them altogether without names: he says, "In India, there is a fine large tree remarkable for the size and delicacy of its fruit; the native ascetics, who live naked, use it for their sustenance: there is another with leaves as long as the Ostrich-feathers worn on military helmets: and there is a third, having long inflected fruit which is delightful to the taste, but occasions flatulence and disorder of the bowels."—*Theophrasti Eresii Historia Plantarum, Græcé et Latiné, cura Johannis Bodæi a Stapel; folio, Amstelodami*, 1644; p. 347.

† Abu Ali al Hossain Ebn Abdallah Ebn Sina, corrupted by the latinists to Avicenna, ranks as the highest authority with the Turkish, Arabian, and Persian physicians. He describes the *Musa* in the second book of his *Canon Medicinæ*, as translated into Latin from the original Arabic, by Gerard of Cremona; folio, Papiæ, 1483. This Canon is a sort of medical encyclopedia,

little nutriment; that it tends to generate an excess of bile and phlegm; and that, although it disturbs the stomach, it does good in inflammation of the chest and lungs, and excites renewed activity of the kidneys when these have become inert: Rhazes* expresses the like sentiments, and adds that it moderates appetency, proves laxative, and assuages irritation of the throat: and, by Serapion,† it is pronounced to be one of the best calefacient and diluent remedies in existence, while he maintains the importance of all the properties ascribed to musaceous fruits, by his medical compatriots. These were followed by the latinists, arabists, herbalists, phytologists, and others, who essayed to make the advantages of foreign travel conducive to the "philosophy of plants." Hence proceeded many descriptive and graphic representations of the chief *Musaceæ*, and thus their alimentary and medicinal energies have been methodically discriminated.

Regarding the magnificent plant, *Musa paradisiaca*, it grows naturally and is cultivated extensively throughout the tropical regions of Asia, Africa and America, for the beauty of its umbrageous foliage and the abundance of its excellent fruit. From a fanciful notion, that the terrestrial Paradise was stocked with the Plantain-tree, its specific name, *paradisiaca*, was originally devised; and, for the sake of its euphony, let no reason arise to require its discontinuance.

From times untold by history, the gymnosophists or "wise men of the east" have been accustomed to seek retirement in solemn groves, overshaded and scented by the banana, whose fruitage yielded full subsistence to these recluses, while they engaged unseen in their feats of self-inflicted severity or in the contemplation of artifices for secur-

in which the simples are arranged in alphabetical order. After experiencing many vicissitudes of fortune, this celebrated person died in A.D. 1036, at Hamadan, where the ruins of his tomb are still pointed out to inquisitive strangers.

* Mohammed Ebn Secharajah Abubeker Abrasi *(Rhazes)* acquired a high reputation at Bagdat, both as a teacher of the medical sciences and as a physician. His observations on the *Musa* are given in the twentieth chapter of the third book of his work, intituled *Almansor*; *hoc est, Ad Regem Corassani Mansorem Libri decem; folio, Venetiis*, 1510. He visited many foreign countries, and died in the eightieth year of his age, about the beginning of the tenth century.

† John Serapion was an eminent Arabian physician, who flourished during the last half of the tenth century. He treats of the medicinal properties of the *Musa*, in the eighty-fourth chapter of his collection, having the title, *Practica sive breviarium; folio, Venetiis*, 1479. This is a composition from the Greek and Arabian physicians, upon the natural history and virtues of medicines.

ing the dominion of a spurious sanctity over the weakness of unenlightened and superstitious veneration. When this tree, seeming every way "good for food, and pleasant to the eyes," and dispreading a delightsome shade for sages desirous of appearing wise—when this tree first presented itself to the observation of ancient naturalists, the pupils perhaps of Aristotle, they would readily designate it Ἰνδῶν σοφῶν the wisemen's tree, a specific appellation now in Musa *sapientum* hallowed into established usage by the sanction of the highest botanical authorities. By the priests who administered the primitive Egyptian mythology, the banana-leaf had an exact signification in the symbolical circle of foliage which denoted the eternity of God, and was intended by its mystery to eleviate the minds of His worshippers to meditation on His divine attributes as the uncreated Creator and providential Ruler of the universe.

SKETCHES OF EUROPEAN ORNITHOLOGY.

Gould's "Birds of Europe."

Parts XIII. and XIV.

Part XIII.—On opening the present part of Mr. Gould's series, we are greeted by a pair of our old and familiar friends the Reed Buntings, *Emberiza schœniculus*,—Bruant de-roseau, *Fr.*—Zivolo di padule, *It.*—Rhorr Ammer, *G.*,—though, in truth, we scarcely think justice has been done them in the figures, which give the idea of much too bulky and heavy birds. The male is very fair, but at the same time his characters are so striking that the merest daub would suffice to render him recognisable. The male of this species, it is well known, only acquires his full beauty with the spring of the second year. The female and young, according to authors, are similar, but every practical ornithologist well knows how to distinguish them.

Barred Ulule, *Ulula nebulosa*,—Chouette nébuleuse, *Fr.* A spirited figure, by Lear, representing an adult male rather less than the natural size. It is not one of Lear's best. Rarely occurs fur-

ther south than Scandinavia, where it is very scarce. Distributed throughout the U. S. where, says Audubon, his cry may be heard in the evening, resounding from every part of the forest. "Mr. Audubon further remarks, that its powers of vision during the day seem to be very equivocal, he having seen one alight on the back of a cow, which it left so suddenly, on the animal moving, as to leave no doubt on his mind that the Owl had mistaken the object upon which it had perched for something else." Feeds on young Hares and Rabbits, Mice, small birds, Frogs, Lizards, &c.—Lays, in the holes of decayed trees, or the deserted nests of Crows and Hawks, from four to six pure white rounded eggs. The male is somewhat smaller than the female, and the intensity of the tints varies considerably.

Hazel Gelinotte, *Bonasia Europæa*,—Tétras gélinotte, *Fr.*—Francolino di monte, *It.*—Schwartzkehlige Waldhuhn, *G.* Lovely figures of a male and female, natural size. "The half-plumed tarsi, the crested head, and the tuft of feathers on each side of the neck, are features peculiar to the genus *Bonasia*; in the present species, this latter character is but slightly indicated, but is exhibited to a greater extent in a species from America. *B. Europæa* is the only species yet discovered in the old world, but it has its representative in the new, in the well-known *B. umbellus*, &c. Although the Hazel Gelinotte does not equal the Ptarmigan in flight, its powers in this respect are far from being inconsiderable. They frequently perch on trees, and love to dwell in wooded plains skirting hilly and mountainous districts; they feed on alpine fruits and berries, to which are added the tops of Heath, Fir, Juniper, and other tender shoots. They fly off in packs or companies, and are not so shy or distrustful as most other members of this family; when disturbed they perch on trees, and are then easily approached and shot.—The Hazel Gelinotte is dispersed over the continent of Europe from north to south, inhabiting nearly all the elevated ridges and natural boundaries of the different countries. Dr. Latham states that they are so abundant on a small island in the Gulf of Genoa, that the name of Gelinotte Island has been given to it. It also inhabits France, Germany, Sweden, Norway, and Russia, thus extending from the sultry regions of Italy to the limits of the arctic circle." Is never met with in Britain, and appears to be exclusively confined to the European continent. The eggs are from ten to twelve, rusty red, spotted with a darker colour, and are laid on the ground, at the foot of a Fern or Hazel-stem. The female, besides being less brilliant in tints than the other sex, wants the red naked skin behind

the eye.—This bird " is held in high esteem for the table, for which purpose thousands are yearly captured."

Sedge Reedling, *Salicaria phragmitis*,—Becfin phragmite, *Fr.*—Schilfsanger, *G.* Although every one knows that there is no difference of plumage in the sexes of these birds, we think our author would have displayed better taste had he given a companion to the solitary and cheerless individual at present figuring on a plate two feet in length; nor can we much admire the figure, although his drooping appearance on the present occasion is doubtless owing to his separation from his mate! The Sedge Reedling is common in all the moist parts of Britain, and its nocturnal song is almost as pleasing to the true ornithologist as the more luscious strains of Philomel; and, were they poured forth more sparingly, might come in for a share of that applause so universally conceded to the latter, whose praises have been a theme of inexhaustible admiration with the poets, time immemorial.

The next plate represents a pair of Common Quails, *Coturnix dactylisonans*, Meyer,—Caille, *Fr.*—Coturnice, *It.*—Wahtel Feldhuhn, *G.* Any one unacquainted with these pretty little creatures in their natural state, would entertain an idea that the birds were larger than they actually are from an inspection of these figures. Few faults are commoner than this in drawings of animals of all classes, and it is a pity that artists do not guard against it more carefully. The quail is very widely dispersed in the old world. " So vast and countless are the flocks which often pass over to the islands and European shores of the Mediterranean, that a mode of wholesale slaughter is usually put in practice against them, which no doubt tends to limit their inordinate increase. They are polygamous in their habits; and in the migrations the males always precede the females, and are easily decoyed into nets by an artificial imitation of the voice of the latter."—In Britain, the Quail is sparingly but equally distributed, arriving in spring, and departing, with the fall of the year, for the south. Lays eight to twelve eggs, " pale yellow brown, blotched and dotted with darker brown and black," and deposits them on the bare ground. The throat, black in the male, is white in the female and young.

Rüppell's Fauvet, *Ficedula Rüpellii*,—Becfin de Rüpell, *Fr.*—The female in the plate is well deserving of commendation. Both the figures are drawn from specimens in the collection of Dr. Rüppell, the eminent continental zoologist. Inhabits the north and east of Africa, passing occasionally into the adjacent confines of Europe. " M. Temminck informs us that it gives preference to thickly

wooded districts; and from the general form and contour of the body, and particularly its subdued and sober tone of colouring, we may reasonably expect that its general economy is in unison with the birds of our own island belonging to the same restricted genus." The white stripe under the eye, and the black on the throat, at once distinguish the male. Nothing is positively known of its habits, &c.

Great Bustard, *Otis tarda*,—Outarde barbue, *Fr.*—Starda comune, *It.*—Grosse Trappe, *G.* The male and female are represented, rather less than half the size of life. The former is finely executed, by Lear. The history of this splendid and now scarce bird in Britain, is familiar to even the general reader, and need not, therefore, be repeated here.

Spotted Cuckoo, *Cuculus glandarius*,—Coucou tacheté, *Fr.* The figure, of an adult male, natural size, is good, but somewhat soft in expression. "Its true habitat," observes Mr. Gould, "is the wooded districts skirting the sultry plains of North Africa; but the few that pass the Mediterranean find a congenial climate in Spain and Italy, further north than which they are rarely seen." It is not known whether the habits of this bird, as regards propagation, agree with those of our Common Cuckoo or not. The feathers of the head are darker in the middle age than in the adult, and the whole plumage is still deeper in young birds. Of the sexes we are told nothing.—Of course we fully agree with our author that this species has no claim to rank either in *Cuculus* or *Coccyzus*, but it must remain in the former genus for the present.

Northern Diver, *Colymbus glacialis*,—Plongeon imbrim, *Fr.*—Mergo maggiore, *It.*—Schwarzhalsiger Seetaucher, *G.* The figures, representing an adult male and a young bird of the year, two-thirds of the natural size, are highly characteristic. Equally distributed throughout the northern hemisphere, "giving preference to the regions within the arctic circle during summer, and progressing southward as far as lat. 36° on the approach of autumn and winter, at which seasons they are by no means rare in our islands, although, in accordance with that general law of Nature which causes the young to wander further from their native habitat, we find a much greater proportion of immature birds than of those which bear the beautifully contrasted livery of the adult." Subsists on fish, aquatic insects, &c., which it obtains by diving. Builds on the borders and islands of inland seas, lakes and rivers, the nest being placed quite close to the water. This bird lives almost entirely on the water, "though it contrives to propel itself forward (on land) by means of

resting its breast upon the ground and striking backward with its feet somewhat like the action of swimming." The sexes do not differ, but the young birds want the glossy green black on the head and neck of the adults.

Doubtful Sparrow, *Passer petronius*,—Grosbec soulcie, *Fr.*—Grau Fink, *G.* We do not remember to have seen a specimen of the Doubtful Sparrow (the Foolish Sparrow of Latham and others), and cannot, therefore, say whether the figure, of a male, natural size, is characteristic. According to Dr. Shaw, " this species is found over the greatest part of Europe, in the southern portions of which it is migratory, but is nowhere so common as in Germany. It is not found in this country: it affects woods, and builds in the holes of trees, laying four or five eggs, and feeds on seeds and insects. These birds are very delicate, as numbers are often found dead in trees in winter, during which time they assemble in flocks." The sexes of this species are similar; and this and other characters point out the propriety of removing it from the genus *Passer*.

Rook Crow, *Corvus nudirostris*, Palmer,—Corbeau freux, *Fr.*—Saat Rabe, *G.* An excellent figure of an adult, rather under the size of life, is given. We conclude that our readers, one and all, are as well acquainted with the history of this venerable bird as we are, and we shall not affront our subscribers or the Rook by giving a detailed description of its mode of life.

Common Sandpiper, *Totanus hypoleucos*, Chevalier guignette, *Fr.*—Piovanello, *It.*—Trillender Strandläufer, *G.* The figures, representing, of the natural size, an adult and a young bird in autumn, are both pretty and characteristic, though not altogether devoid of stiffness as regards attitude. Occurs in India, Africa, and Europe, including Britain, where it arrives at the end of April, and departs in September. Food, insects, Snails, Worms, crustacea, &c., " in capturing which its motions are not less elegant than graceful, running with agility over the oozy mud and sand-banks, often exhibiting a peculiar and singular jerking of the tail, and a nodding of the head not unlike that of the Common Gallinule and some of the terrestrial Pigeons of the West Indies." In Britain " the task of incubation is commenced soon after its arrival, the female depositing her four delicate eggs, of a pale reddish white ground spotted with darker red, on the bank near the water's edge, a mere hollow in the soil or depression in the shingle serving instead of a nest." The male and female are similar, and the young birds only differ from adults in having the edges of the feathers fringed with a margin of greyish white.

Ivory Gull, *Larus eburneus*,—Mouette blanche, *Fr.* The plate, representing an adult male, rather more than three-fourths of the natural size, is to our liking. Inhabits the arctic circle, very rarely visits the temperate portions of Europe, and has only been taken two or three times in this country. Its first capture in this country was announced in the *Memoirs of the Wernerian Society*, by L Edmonston, Esq. Said to breed in rocks overhanging the sea. Eggs unknown. In the solitary wilds which it inhabits " it is constantly accompanied by the Fulmar Petrel; and, like the generality of its tribe, which are constantly observed in the neighbourhood of shipping, it is always to be seen following the whalers and feeding upon the refuse thrown overboard, which, with blubber, small fish, and crustacea, forms the principal portion of its diet. Both sexes are distinguished for the snowy whiteness of their plumage, but the young are of a uniform dark grey the first autumn, " which gradually gives place to a mottled livery of black and white, the ends of the primaries and tail retaining the dark marking the longest, and until the end of the second year. It is also said that the immaculate white plumage is that of summer, and that the head and neck are streaked with grey in winter."

Cretzchmar's Bunting, *Emberiza cæsia*,—Bruant cendrillard, *Fr.* A pair are figured, and the female is particularly well executed. This beautiful and rare Bunting was added to the European fauna by Dr. Cretzschmar, of Frankfort, as a straggler in the southern and eastern portions of that continent. Inhabits Syria and Egypt. As Temminck suggests that it may have been mistaken for a variety of the well-known *E. cia* or *E. hortulana*, it may possibly be of more frequent occurrence in Europe than is at present supposed. The plumage of the female is less bright than that of the male. Of the habits, &c., little is ascertained.

Great Auk, *Alca impennis*,—Pingouin brachiptère, *Fr.* An adult in summer dress, and two-thirds of the natural size, is remarkably happily figured, in the act of devouring a fish. " The seas of the polar regions, agitated by storms and covered with immense ice-bergs, form the congenial habitat of the Great Auk: here it may be said to pass the whole of its existence, braving the severest winters with the utmost impunity, so that it is only occasionally seen, and that at distant intervals, even so far south as the seas adjacent to the northernmost parts of the British Islands." Extends throughout the arctic circle, is unable to fly, and progresses on land with difficulty, but, as might be anticipated, is extremely expert in the water. " Here it is truly at ease, following its prey,

which consists exclusively of fish of various species, with the utmost facility." Lays one egg on the bare rock, just above the reach of the highest tides. "Its colour is tinged with buff, marked with spots and crooked lines of brownish black. The young take to the water immediately after exclusion from the egg, and follow the adults with fearless confidence." In winter, the jet black on the throat and neck give way to white.

Chaff Finch, *Fringilla cœlebs*,—Grosbec pinson, *Fr.*—Fringillo comune, *It.*—Gemeine Fink, *G.* We really think Mr. Gould might have given figures more worthy of his distinguished fame as an ornithological painter, though, unquestionably, they might have been much worse. Every field ornithologist of any experience well knows that the sexes of this bird separate at a certain season. None of our smaller native birds are more universally or plentifully distributed in Britain than the Chaff Finch. The tints of the male are far brighter in spring than in winter.

Gargany Teal, *Querquedula circia*,—Sarcelle d'été, *Fr.*—Anatra cercedula, *It.*—Knak Ente, *G.* Our author has succeeded as well with this species as with most of his other *Anatidæ*, figuring an adult male and female of the natural size. Dispersed throughout North Africa, Asia, and Europe, passing into the British Islands in April and May, frequenting lakes and meres. It proceeds to more northern countries to breed, placing its nest amongst herbage near the water; lays eight or ten white eggs. Feeds, like the other Ducks which are incapable of diving, on the tops of aquatic plants, insects, shelled Snails, and their larvæ. The beautiful tints of the adult male in summer at once distinguish the nuptial attire. The young males, and adult males in winter, closely resemble the female.

Black-backed Gull, *Larus marinus*,—Goêland à-manteau-noir, *Fr.*—Mantel Meve, *G.* A beautiful figure of an individual two-thirds of the natural size, and represented swimming. Inhabits Europe and America, and is common in Britain. It is three years coming to maturity, and this circumstance has, of course, caused much confusion, by multiplying synonyms. "The British Islands afford several localities which are resorted to by this Gull for the purpose of breeding, among which, according to Selby, may be enumerated the steep holmes and sandy islands in the British Channel, Souliskerry in the Orkneys, the Bass Island in the Firth of Forth, and one or two stations on the Scottish coast." The nest, placed on the ground, consists of Reeds, Rushes, and Flag leaves. "The eggs are three in number, like those of the Herring Gull in shape, but

larger; the ground colour of various shades of brown, always blotched and spotted with darker brown." Feeds on half-decomposed animal matters, refuse from ships, marine crustacea, &c. The female is somewhat smaller than the male. The white on the head and neck of adults becomes grey in winter. The young are mottled grey and white.

Sand Swallow, *Hirundo riparia*,—Hirondelle de-rivage, *Fr.*—Rondine riparia, *It.*—Ulfer Schwalbe, *G.* The birds are well figured, and the species is common and well-known. We have seen a light-coloured variety.

Corn Bunting, *Emberiza miliaria*,—Bruant proyer, *Fr.*—Grau Ammer, *G.* The plate represents, of the "bigness of life," as honest George Edwards would say, an adult male. It is too large and thick, but otherwise good. Some communications relative to the distribution of the Corn Bunting in England, published in *The Naturalist*, No. XII., for Sept. 1837, prove that it is neither so generally nor so abundantly distributed with us as commonly imagined.

PART XIV.—Peregrine Falcon, *Falco peregrinus*,—Faucon pélerin, *Fr.*—Sparviere pellegrino, *It.*—Wander Falke, *G.* Although we certainly can have little to find fault with in the figures, representing an adult and a young bird of the natural size, we should not have guessed they were from the pencil of Mr. Lear, but for his name appearing on the plate. They are not hit off with his usual boldness, and the birds look too much like the dull inhabitants of a prison. Otherwise their form and colour are unexceptionable. Mr. Gould is inclined to consider the Peregrine Falcon of Europe and America distinct species, though the point is by no means settled. "In England this beautiful Falcon remains the whole year: it appears to give preference to the bold rocky cliffs that border the sea, in the most inaccessible parts of which it builds its eyrie, generally laying four eggs, of a uniform dark red colour." The young birds only acquire their adult plumage with the fourth or fifth year, and the remarkable changes they undergo have occasioned the synonyms attached to individuals in different stages. The elegance and rapidity of the Peregrine Falcon's flight is well known, and it feeds on various birds, giving the preference to Ducks, Teal, &c. The male is smaller than the female, and more blue on the upper parts. The young of the year have the upper surface brown, each feather being tipped with a lighter hue.

Common Goldwing, *Carduelis elegans*,—Grosbec chardonneret, *Fr.*—Distel Zeisig, *G.* We are certain either that Mr. Gould thinks he has failed in his representations—the figures, of an adult

and a young bird, being, in fact, *misrepresentations*—or that he has never studied this beautiful species in its native haunts. The Common Goldwing (or "Gold Finch") is limited to Europe, preferring wild mountainous districts in winter. In England it is common about our orchards, gardens, fields, hedge-rows, &c., in spring and summer, but it is not often met with in these localities during the inclement seasons. Its general history is familiar to every bird-fancier.

Manks Shearwater, *Puffinus Anglorum*, Ray,—Pétrel Manks, *Fr.* The adult male, size of life, is given, with good effect. Selby believes that the diminution in the number of this species wherever man takes up his abode, is to be attributed to the greedy destruction of the eggs and young, which are much sought after for the table. Our author believes that the species is still common on the coast of South Wales. The Manks Shearwater is a truly oceanic species. It breeds in deserted Rabbit-burrows, crevices of rocks, &c., laying one white egg. Food, crustacea, fish, molluscs, &c. "Giving a decided preference to the western coasts of our islands, they are tolerably abundant in Ireland and the Western and Orkney Islands. After the breeding season, they retire southwards, even beyond the Mediterranean, where, in consequence of the increased temperature, they find a greater supply of food than they could in more rigorous climates during the winter." The sexes and young are similar, or nearly so.

Common Gallinule, *Gallinula chloropus*, Lath.,—Gallinule ordinaire, *Fr.*—Grunfussiges Rohrhuhn, *G.* This plate, representing an adult male and a young bird, in their natural haunts, could hardly be surpassed. Few species are more universally distributed, or more abundant everywhere, than the present. It appears to occur in every part of the globe. We may add to our author's description, that we have several times seen the nest six or seven feet from the ground, in Portugal Laurels and other bushes near the water, or overhanging it. When the young are hatched in these instances, they are probably conveyed to the water in their parents' bills, a mode of conveyance which we have reason to believe is not uncommon with the species. When with a friend, we once started a large Pike in a shallow ditch. The fish had previously remained quiet several minutes, but the moment it darted off, a Gallinule swam from the same spot. It was a young bird of the year, and was easily caught. Whether or not the Pike had fixed his eyes on the Gallinule did not appear; but probably neither the fish nor the bird were aware of each other's presence.

Yellow-breasted Warbler, *Sylvia hippolais*,—Becfin à-poitrine-jaune, *Fr.*—Gelebaüchiger Sanger, *G.* This is not a British bird, although our common Darklegged Warbler *(S. rufa)* has often erroneously received the name *hippolais*. "Although we cannot with propriety separate the present bird from the true Willow-wrens, [Warblers, *Sylvia*.—Ed. *Analyst*], still we cannot but be struck with the shorter and stouter contour of its body, and its more robust bill; it also differs considerably in its habits and mode of nidification; all those species that inhabit England constructing a singular domed nest, which is always placed on the ground, while the species here illustrated invariably builds on trees, sometimes in the shrubs of the garden, at others in the trees of the forest; laying five eggs, of a reddish white blotted with spots of a darker red. Those who have not had an opportunity of listening to the song of this little tenant of the grove can scarcely form an idea of its power and melody, in which respects it is only equalled by those of the Blackcap and Nightingale." Dispersed throughout the European continent. The sexes do not differ. Feeds on small insects, caterpillars, &c. The figure, of an adult male, is very good.

Andalusian Turnix, *Hemipodius tachydromus*,—Turnix tachydrome, *Fr.* A male and female of this somewhat singular-looking creature are given, of the size of life. "Tolerably abundant at Gibraltar and that part of Spain which borders the Mediterranean, being more scarce in the central portions, and in the northern and all similar latitudes altogether absent." Feeds on insects, seeds, &c. "Temminck states that they are polygamous, and that they give a preference to sterile lands, sandy plains, and the confines of deserts, over which they run with surprising quickness; also that the young and old do not associate in bevies like the Quail." The sexes are similar. The members of the genus *Hemipodius* differ from the Quails in wanting the hind toe, in their much smaller size, and in their long slender bills. We have little practical knowledge of the present species, and will therefore suppose our author's figures to be characteristic until we are certain of the contrary, as reliance may almost invariably be placed both in the plates and letterpress of the *Birds of Europe*.

Robin Redbreast, *Rubecula familiaris*,—Becfin rouge-gorge, *Fr.* —Rothbrustiger Sanger, *G.* We are almost ashamed of saying anything respecting either the plumage or habits of Robin in a quarterly journal of science, and shall therefore merely observe that the three figures—of an adult male and female, and a fully-fledged young bird—are the best we have seen of the species.

Cinereous Surn, *Surnia cinerea*,—Chouette Lapone, *Fr.* We do not, on the whole, particularly admire the plate, which represents an adult male, three-fourths of the size of life. Occurs occasionally in Scandinavia, Lapland, and Russia, but is only common and indigenous in some parts of North America. According to Dr. Richardson, "it keeps within the woods, and does not frequent barren grounds, like the Snowy Owl, nor is it so often met with in broad day-light as the Hawk Owl, but hunts principally when the sun is low; indeed it is only at such times, when the recesses of the woods are deeply shadowed, that the American Hare and the marine animals, on which the present species chiefly preys, come forth to feed." M. Paikul, a Swede, states that a specimen in his collection measures two feet eight inches, being larger than the female of *Bubo maximus*. Dr. Richardson discovered a nest "on the top of a lofty Balsam Poplar, built of sticks and lined with feathers. It contained three young, which were covered with a whitish down." The sexes differ considerably in size—the female, of course, being much larger than the male—but they are similar in plumage.

Black-tailed Godwit, *Limosa melanura*,—Barge à-queue-noire, *Fr.*—Pantana pittima, *It.*—Schwarzschwanzige Sumpflaufer, *G.* The plate represents adults in summer and winter plumage, living size. Distributed throughout Europe, and occurring also in India and Africa. "In its manners it is elegant and graceful. The flesh of the adult is rather coarse and rancid, but the young of the year are more delicate, and are therefore more in request for the table. A few pairs annually resort to the marshes in the neighbourhood of Yarmouth, and to the fens of Lincolnshire; but they are rarely permitted to breed unmolested, their large size and peculiar actions being sure to attract the notice of the sportsman or the egg-gatherer. The eggs are four in number, of an olive green faintly blotched with black, and are deposited on the bare ground, among the herbage, with little or no nest." Feeds on Worms, insects, larvæ, &c. It runs and flies with ease and rapidity. "The female surpasses the male in size, and frequently in the brilliant colouring of the summer plumage." The rufous tints of summer wholly disappear in winter, and the young of the year may be known, amongst other distinctions, by the white streak between the bill and the eye.

Blue Tit, *Parus cæruleus*,—Mésange bleue, *Fr.*—Cinciallegra picola, *It.*—Blau Meise, *G.* The plate is good, though perhaps the figure of the male is scarcely so excellent as that of Lewin. Mode of life well known.

Kittiwake Gull, *Larus rissa*,—Mouette tridactyle, *Fr.*—Gabbianco terragnala, *It.* An adult and a young bird of the year are represented, natural size. The latter is a fine figure. Occurs on the continent and in Britain, in the latter as a summer bird of passage. The short hind toe, characteristic of this species, has induced Stephens to institute a new genus, under the title of *Rissa*, in which Mr. Gould is not inclined to follow him. The young birds have been described as *L. tridactylus*, a specific name which must now fall to the ground. Young birds have the bill black; in adults it is of a dark olive-colour. The mature dress is acquired at the second autumn. Breeds on the ledges of bold precipitous rocks overhanging the sea, forming the nest of dried grass and Sea-weed; its two eggs are olive-white, blotched with dark brown and purplish grey. "The name Kittiwake is given to this bird from the peculiar call during the season of incubation, which the male reiterates as he wheels round his mate upon the nest, or pursues his way on buoyant wing over the surface of the waves."

Red-breasted Flycatcher, *Muscicapa parva*,—Gobemouche rougeâtre, *Fr.*—Kleiner Fliegenfanger, *G.* The young bird of the year, in its second plumage, in the plate is remarkably pretty, but we are not acquainted with this rare bird. The adult male bears no small resemblance to our Robin Redbreast, and Mr. Gould observes that "the first plumage of the young birds is spotted as in that species." Its manner and action are strikingly peculiar, and appear to partake of those appertaining to the species of more than one genus; it resembles the Robin not only in the colour of its plumage but in several of its actions*, being sprightly and animated, constantly jerking its tail and depressing its head in the manner our Redbreast is observed to do; it also imitates the Whin Chat in the depressed oscillating movement of the tail: thus it appears to form an intermediate link between the *Muscicapidæ* on the one hand, and the *Saxicolinæ* on the other. In the comparative length and robust form of its legs, this intermediate station is also further evinced; for though the tarsi have not the strength which we see in the true *Saxicolinæ*, still they are more developed than in the genuine Flycatchers. It is a bird of migratory habits, and in Europe its habitat appears to be limited almost exclusively to the eastern portions of the continent. It is tolerably abundant in the neighbourhood of Vienna,

* We made the comparison between *M. parva* and the Robin Redbreast—at the beginning of the above description—previous to perusing Mr. Gould's account.—Ed. *An.*

and is known to breed annually in the woods of that district. From the circumstance of our having seen it in collections from the East Indies, particularly from that portion adjacent to Persia, it is doubtless widely diffused over the neighbouring regions." The nest is placed among the interwoven leaves of trees, or the forks of branches. Eggs unknown. Feeds on soft-winged insects, which it takes on the wing, and also, our author opines, on berries. The breast, red in adults, is light yellow in young birds.

Spotted Eagle, *Aquila nævius*,—Aigle criard, *Fr.*—Schrey Adler, *G.* A very creditable figure, by Lear, of a bird in the plumage of the second year, three-fourths of the natural size. "It is sparingly dispersed through Germany, the Pyrenees, and Russia; and, from the circumstance of individuals having been received from India, we may conclude that those found in Europe are only a scattered few, dwelling in the extreme limits of their true habitat. According to Temminck it is common in Africa, and especially in Egypt; hence we may infer that its range is throughout the south-eastern portions of the Old World." Builds in high trees, and lays two light-coloured eggs, thinly blotched with reddish-brown. Feeds on small quadrupeds, and, which is remarkable for an Eagle, on various large insects. In many of its habits it is said closely to resemble the Golden Eagle, but it is much smaller than that bird. The female, as in the other *Falconidæ*, is considerably larger than the male, but the sexes are similar in colouring. This species is four or five years acquiring the mature plumage. Young birds are much spotted, but the spots gradually decrease in number and distinctness, and become nearly effaced in adults, whose whole plumage is of a rich glossy brown, the primaries being black.

Siberian Corythus, *Corythus longicauda*,—Bouvreuil à-longue-queue, *Fr.* The plate contains figures of the male and female, size of life, both excellent, but the former truly admirable. Inhabits the high northern regions of the old continent, especially Siberia, where it is abundant. Migrates in winter to the more southern portions of Russia and Hungary. "In its general economy it resembles the Pine Grosbeak [or Thickbill], and its food is said to consist of wild berries, the buds of trees, &c." Nidification unascertained. The lovely rosy tints of the male are clear olive-colour in the female. It seems probable that a partial change of hue takes place at the autumnal moult, the plumage becoming lighter, and the feathers being bordered with whitish.

Daw Crow, *Corvus monedula*,—Corbeau choucas, *Fr.*—Cornac-

chia, *It.*—Turm Rabe, *G.* An adult male and female are figured, natural size, and very beautiful. The female is peering out of the hole of a tree. This bird is distributed throughout Europe, and also in the contiguous portions of Asia and Africa. That the Daw Crow is omnivorous, that it breeds in hollow trees or rocks, and that the sexes are alike in plumage, it is almost unnecessary here to observe.

Pine Bunting, *Emberiza pithyornus*,—Bruant à-couronne-lactée, *Fr.* A pair of these birds are spiritedly executed. Inhabits the north of Russia and Siberia, but also occurs as far south as the centre of Turkey, &c. This bird, like most of the Buntings, possesses a handsome shape and plumage. The colours of the female are more dusky than those of the other sex, and she wants the "*couronne lactée*" of the male. "In size, this rare Bunting rather exceeds *E. citrinella*," our common Yellow Bunting.

Common Curlew, *Numenius arquata*,—Courlis cendré, *Fr.*—Chiurlo maggiore, *It.*—Grosse Brachvogel, *G.*—Graawe Wulp, *Nederl.* The plate represents, in a very superior manner, an adult male, of the natural size. This large but shy species is dispersed throughout the old world, appearing equally at home in all climates. "In the temperate portions of Europe they pass the winter on the sea-coast, and retire to the highlands of Norway during the summer." In England a few remain to breed. Feeds on marine Worms, crustacea, &c. "The Common Curlew possesses extraordinary powers of flight, and is consequently enabled easily to pass from the shores of the sea, at every rising tide, to inland wilds, fields, morasses, &c., and by some peculiar instinct to return to the coast almost at the moment of the commencement of the ebb." They lay on the ground, making scarcely any nest, and employing the same manœuvres as the Peewit to draw enemies from the spot. The sexes do not differ.

Fuscous Gull, *Larus fuscus*,—Goëland à-pieds jaunes, *Fr.*—Gabiano zafferano, *It.*—Herrings Meve, *G.* An adult and a young bird of the year are well represented, rather more than two-thirds of the natural size, but the situation of the youngling behind the other is not judicious—nor, we may add, courteous! "On the shores of the continent of Europe its habitat is spread from the Baltic to the Mediterranean." Feeds on mollusca, fish, &c., which it procures in the sea, or in lakes and rivers. Builds in marshes, and on rocks near the sea-shore, a nest of dried grasses, and lays three or four deep olive brown eggs, blotched with brown. The

general habits and haunts resemble those of *L. marinus*. The young birds are dark brown; the sexes are similar, but the head and neck of adults are dashed with brown in the winter.

This part closes with a splendid figure of an adult male, one third less than the natural size, of the Bean Goose, *Anser segetum*,—Oie vulgaire, *Fr.*—Oca salvatica, *It.*—Saat Gans, *G.* "In the temperate portions of Europe, and especially in the British Islands, the Bean Goose is rather a winter visitor than a permanent resident." Extensive marshes and lakes are its favorite resorts, but it will frequently approach the low grounds, feeding on Peas, Beans, and Wheat. In spring they migrate northward to breed. Breeds in marshy spots, laying from eight to twelve white eggs. There is no sexual or seasonal change of plumage worth noting. The Bean Goose is distinguished from the Greylag Goose by the bill of the former being much smaller, and black. The figure in the plate is represented swimming, and is altogether worthy of study.

OBSERVATIONS ON INSANITY AND LUNATIC ASYLUMS.*

Mr. Browne professes a most laudable object in publishing these lectures. His desire is—to draw the attention of the public, and especially of those who, by profession or philanthropy, are engaged in performing works of mercy, to the consideration of what has been done, and of what remains to be done, for the relief of the most unfortunate of our fellow-men—of those who may be almost literally said to "sit in darkness and in the shadow of death, being fast bound in misery and iron." His object then is a noble one; and his pleadings in behalf of the "most unfortunate" abound with a pure pathetic eloquence; and, we would hope, it will be the prayer of every truly benevolent mind, that they may prove extensively influential and permanently successful.

* Being the Analysis of *What Asylums Were, Are, and Ought to Be*; forming the substance of Five Lectures delivered before the Managers of the Montrose Royal Lunatic Asylum, by W. A. F. Browne, surgeon and medical superintendent of that institution; 8vo. Black, Edinburgh; and Longman, London, 1837; pp. xii. 240.

For its title, Mr. Browne's first Lecture has the inquiry—"*What is Insanity?*" This question embraces relations which are as comprehensive as they are extraordinary, and Mr. B. opens its resolution in these remarkable terms:—

"The question may be put and answered in two senses—either philosophically or practically; either as directed, to ascertain the actual condition of the mind which constitutes disease, or to determine that amount of diseased action which compromises the safety of the sufferer and justifies legal interference. Our chief concern is with the aspect which the disease presents, after the law has interfered. In order to arrive at just conclusions on such a subject, it is incumbent on us to understand something of the nature and powers of the mind while in possession of health and vigour. This is generally overlooked in the investigation, and the verdict of the public and of a jury is as recklessly and ignorantly pronounced respecting mental strength, as if the points at issue were the discovery of the perpetual motion or the utility of a comet. It is not to be expected that either of these tribunals should be composed of metaphysicians; but it is highly desirable that every man, qualified by his station in society to judge or legislate in such matters, should be competent by education to found and form his judgments on a knowledge of what consciousness and observation shew to be the laws of our spiritual nature. So vague are the ideas generally entertained, or rather so destitute is the great majority of even educated men of any ideas or definite opinions as to mental philosophy, that very recently the capability of repeating the *Multiplication Table* was gravely propounded in an English court of law as a test of sanity. This looks like satire on the reputed money-making propensities of this nation, but the proposal had no such origin. And to prove how momentous the interests are which hinge upon a clear comprehension of what insanity is, it may be mentioned that in the very case where this arithmetical crux was suggested, immense property and the reputation and affections of many individuals were at stake."

Philosophy and Revelation harmoniously associate in representing the Mind and the Body as two distinct things, having their natural elements and constitutions essentially different; although, while confined to this world's sphere, these two things do most intimately co-exist and co-operate under mutually determinate laws—the former, by some high mysterious power, using an organic system of the latter as the vital instrument through whose functions all the mental states and actions are manifested. Deriving instruction

from both these sources, most reflecting Physiologists regard the doctrine as being demonstrated—that the Brain is the organic system which the Mind thus uses as the instrument of its operations, under all the forms of its being, feeling and acting; and that, as the Mind is a collective system of faculties, so the Brain is a collective system of organs whereof every one performs exclusively the appropriate office of subserving one individual faculty solely as its own peculiar instrumental agent. This is a fundamental distinction; and, although it ought always to be carefully, constantly and prominently maintained in every discussion on the mental science, yet there are writers who expose themselves to be charged with a defect of precision, by their indiscriminate employment of the words *organ* and *faculty*, as if they were convertible terms, and thereby expose themselves to be charged still farther with the offence of encouraging fictions, which tend to displace the immortal mind of man from the high station which the Deity assigned to it in the intelligent creation.

Throughout his volume, Mr. Browne exerts unusual care to preserve both precision and perspicuity in inculcating the important doctrine—that every appearance of unsoundness in the mental faculties, is a manifest symptom of disease in the brain; and, as such, it ought ever to be considered as a principal object of treatment, in cases of Insanity. He distinguishes the mental powers or innate faculties of the Mind into four classes,—the mere animal impulses or propensities; the moral sentiments; the perceptive powers;* and the reflective or rational powers. Now, to every faithful observer of the human character, the fact must be apparent—that the manifestations of all these faculties are gradually developed and gradually decline; that they are weak in infancy, strong in maturity, and again weak in old age; and that their evolution and decay correspond with successive changes in the structure of the brain. Farther, as Mr. B. justly observes, it has been ascertained—that the condition or intensity of these manifestations is influenced by the state of the body from external or internal stimulation; that in certain affections of the nervous system, their activity is impaired; and that, in certain cerebral diseases, they are altogether extinguished. Lastly, it has been proved—that the integrity and vigour of these manifestations depend upon the integrity and vigour of the brain; that, if this organ be prevented from attaining a certain size, the

* When the term *Power* is employed with reference to the *Mind*, it may be considered as synonymous with *Faculty*.

lowest only of the mental manifestations, and these but feebly, can be exhibited; and that, if the brain should be injured by accident or disease, these manifestations are diminished in number, impaired in strength or annihilated.

Mr. Browne abstains from inquiring—in what manner the connexion between Mind and Matter, is effected; and he thinks it probable, that the link will ever escape human research. This statement of his, and his distinction, constitute an essential principle of the Truth which is universal and eternal: they shew, that Mind is one thing, and that Matter is another different thing; and they shew, that these two distinct things are connected by a third thing or link which, in Mr. B.'s mind, is all but inscrutable. He might, however, have advanced one step farther, and recognised the proposition—that the third distinct thing, the connecting link, is Life which unites Matter and Mind in one form of co-existence, and thus makes every animated being a threefold individual, endowed with three distinct, though correlative, kinds of energy and power. He goes on to say, with a praise-worthy earnestness:—

"Enough has been disclosed to teach us the importance of recognising the connexion between Mind and Matter, and of making it the foundation of all inquiries into the nature of mental alienation, and of all attempts to improve the condition of the insane. From the admission of this principle, derangement is no longer considered a disease of the understanding, but of the brain, the centre of the nervous system, upon the unimpaired constitution of which the *exercise* of the understanding depends. The brain is at fault, and not the mind. The brain is oppressed with blood; it is irritated; it is softened; and the ideas are confused, the feelings exalted, because those parts of the system with which their healthy *manifestations* have been associated in this world have undergone an alteration. But let this oppression be relieved, this irritation he removed, and the Mind rises in its native strength, clean and calm, uninjured, immutable, immortal."

Seeing the absolute truth of this doctrine, and the positive certainty of the facts which establish it, that the Mind's native strength can be neither injured nor changed, what again is Insanity? Mr. B. replies, it is inordinate, irregular or impaired action of the Mind, depending upon and produced by an organic change in the brain which is the Mind's instrument; and the extent of the disease corresponds to the extent of the injury or destruction of the cerebral structure. Precisely as a perfect hand cannot make good writing with a bad pen, so the uninjured and immutable mind can never

display sound feeling, perceiving or reflecting by means of an unsound or defective brain. Insanity being strictly a bodily disease, its nature, intensity and aggravations must be regulated in a great degree, Mr. B. judiciously observes, by the relations of the brain to the other organs of the body, and the relations of both these to external agents; and farther, if such a dependence does exist, an equally intimate connexion must obtain between the state of these organs and external agents, and the remedies exhibited for curing the disease.

Dr. Haslam, whose head was the receptacle of some practical knowledge concerning Insanity, is said to have repeated these miserable conceits in a court of justice,—that he "*never saw any human being who was of sound mind,*" and that he "*presumed the Deity is of sound mind.*" Mr. Browne discerns the just value of this vapouring nonsense, and proceeds to remark:—

"This is next to asserting that no palpable distinction exists, no line of demarcation can be traced, between the sane and the insane. The line is either ideal or purely geometrical. If the two most widely separated conditions of mind—its greatest strength and serenity and its abject imbecility—be contrasted, the distance appears enormous and impassable; but, if we gradually recede from these extreme points towards the median, it will be found, so imperceptibly do the distinctive marks disappear, and so insensibly do eccentricity on the one hand and enthusiasm on the other, blend together, that the task of declaring this to be reason and that to be insanity, is exceedingly embarrassing, and to a great degree arbitrary. People have puzzled themselves to discover this line, a *terra incognita* which does not exist; the mind being susceptible of as many shades of difference in the strength and relations of its powers as is the body. Another enigma has been propounded—to establish a definition of insanity; that is, to discover one form of words expressive of the nature of a hundred different things."

In being a state having degrees illimitably various, the lowest of these can be detected only by the most experienced and vigilant observers, while the highest are usually distinct and evident to every beholder of their manifestations. This being the case, it is quite clear that the definition of a state so comprehensive cannot usefully embrace more than the chief characters whereby each of its diversities is invariably distinguished. Accordingly, it may be enough to say—Insanity is that preternatural state wherein a person displays *inordinate* motives, or practises *inordinate* actions, *injurious* to himself or others; and the extent to which his motives or

his actions are inordinate and injurious, is the degree of his insanity. Mr. Browne remarks, concerning definitions, that however interesting and edifying these investigations may be to mere philosophers, the philosophical practitioner ought to make the inquiry invariably bear reference to the question, whether isolation would be for the benefit of the patient. He continues—

"The criteria, however, in forming a judgment are supposed to be various and adequate. Is a man able to manage his own affairs, is he violent, virulent, extravagant, or troublesome? These are the questions addressed to medical witnesses: it is rarely demanded, whether confinement will conduce to the restoration of health. That incompetency for business, or irritability, does occasionally require the interference of the law, may be true. Property and the public peace of society must be protected: and, where either the one or the other is threatened or disturbed, no difficulty can be experienced as to the propriety of coercing the violator. Insanity is evidently the cause of such outrages, and insanity of a kind that cannot be efficiently treated without isolation. But, even in such cases, the offender sometimes proves to be a delinquent—a criminal rather than a lunatic, and an asylum becomes more of a penitentiary than an hospital. This is a minor evil: a much greater results from the universal application of such tests leaving lunatics at liberty, and incarcerating sane, or comparatively sane individuals. Thus, for example, the cunning vindictive maniac may be perfectly competent to conduct mercantile, or even more complicated affairs, with ability; he may even prosper in his enterprizes; and yet his treatment of those dependent upon him, of all those who have offended him, of all whom he suspects, may be marked with the maliciousness of the demon, and the indiscriminate ferocity of the maniac. If subjected to such tests, he may never be suspected, until some out-burst of fury, when he is deserted by his usual caution, consigns those around him to death or misery. This man ought to be confined; but he escapes until the evil is done. Again, the man who, from natural inaptitude to details of business, is incapable of conducting his affairs advantageously, may be in all other respects rational and praise-worthy: he may be a good mechanician, an artist, a man of strong affections and irreproachable manners. This man ought to be free; but, being subjected to the same tests, he is confined, until his whole mind is as much enfeebled as were his powers for business. All chances ought certainly to be in favour of the lunatic; for a greater injury is done by the sacrifice of one sane individual, than by the freedom of many lunatics.

The test ought to be as general as possible, and to have reference, not to the abstract question of what Insanity is, but to the probable consequences which may accrue from the declaration that it exists in every case. Entertaining these opinions, then, in place of endeavouring to *define*, I have *described* the different forms which Insanity assumes, believing that by such a course the interests of Science and Humanity will be better served, than by straining after what the failure of all previous writers nearly proves to be a nonentity."

Considering that an enlightened system of classifying lunatics must depend on the accuracy of the classification of the varieties of the disease with which they are afflicted, Mr. Brown exhibits three different arrangements—Arnold's, Heinroth's, and that which he himself has carefully constructed. He distributes the diversities of Insanity into four closses—*Idiocy*, *Fatuity*, *Monomania*, and *Mania*, and these he establishes with an abundance of concise and perspicuous illustrations.

Idiocy.—This class comprehends four states or gradations:—*First*—that wherein neither sensation nor reason appears to have been bestowed; where the imperfect being seems not to be conscious of light, or of sound, or of hunger; and where sleep alternates with a swaying motion of the body, during the protracted life-time which the unhappy idiot is often left to endure. *Second*—that where the external senses exist without the co-existence of any faculty by which the sensations thus obtained can become objects of reflection. Such individuals prefer light to darkness, experience pleasure from odours, and occupy much time in moving their hands along smooth surfaces. *Third*—that wherein the patients, besides exercising their senses, are able to contract attachments, to display desires, and to feel the first throbs of ambition. *Fourth*—that in which, additionally to these feelings, there is a certain but very limited power of ratiocination, a facility in acquiring a mechanical art, or an aptitude for arithmetical or mathematical studies, without any corresponding evolution of the other powers of mind. Mr. B's. remarks on this four-fold distinction of Idiocy, are apposite and useful.

Fatuity.—This, as a class, is generally an effect of apoplexy, chronic inflammation of the membranes of the brain, or of some signal alteration in the texture of its nervous substance. The malady is often slow, always insidious, in its advances. Half a life-time may elapse, with gradually increasing inconsistencies and imbecility, before the understanding is suspected to be undermined, or the glaring

approach of a second childhood is more than surmised. Fatuity may be partial or complete: it may implicate and enfeeble or destroy one, several, or all of the mental faculties; these may remain, but their strength especially the strength acquired by cultivation, is gone. They no longer act in concert; and the indistinct description of a discovery in mechanics, or a transaction in business, is associated with a prayer or a passionate ejaculation. Some solitary power, or accomplishment, or favourite train of thought, occasionally lingers behind the rest or survives their destruction. From their being at once harmless and independent of society, from the extinction of their social dispositions, the fatuous lunatics have a separate ward allotted for their use in most hospitals, where their existence glides onwards to its peaceful close, undisturbed by cold, or hunger, or darkness, or pain, or any of the few strictly animal irritations of which they are susceptible.—Mr. B.'s picture of Fatuity is as faithful as it is humbling and melancholy.

Monomania.—This is partial insanity, and it takes place when one, several or many of the mental faculties have their manifestations deranged relatively to one particular subject which may be simple or complicate. Fourteen distinct kinds of this malady are succinctly and graphically described by Mr. Browne, as examples of its multiformal appearances. 1. The *Monomania* of *Concupiscence;* with inordinate sexual desire, incontrollable by the powers of self-government, by admonitions, threats, punishment or coërcion, the patient being generally furious and inaccessible to any moral influence. 2. *Monomania* of *Homicide*, or the passion to destroy; with an irresistible impulse to tear or break clothes, furniture, books, plants or other articles valued as objects of usefulness or desire; with a diposition incorrigibly quarrelsome, where the monomaniac seeks grounds of dispute and antagonists, throws all around into turmoil and confusion, and will fight with his shadow rather than suffer his aggressive powers to be dormant; or with an indomitable hatred of human life, superadded to the contentious and destructive inclinations, and a thirst for blood which is insatiable. 3. *Monomania* of *Pride;* either with the exaltation of self-conceit, appearing in the deep and impregnable notion of superiority and indifference or contempt for all that is beneath the egotist, or that does not minister to his affairs or his selfishness; or with these supercilious feelings, coupled with delusions as to the character, circumstances, rank and claims, upon which the visionary pretensions of his haughtiness are based: in the most pertinacious contenders for imaginary dignity, there is no loss of the con-

sciousness of personal identity. 4. *Monomania of Vanity;* with an irrepressible craving for applause, homage and admiration: this craving is the germ of the disease; but, from it, there spring a thousand grotesque manifestations of the appetite and the modes in which it requires gratification: with the vain monomaniac, the mind's errors all tend towards the excitement of wonder and approbation: he is a cringing beggar for the smallest mite of praise or deference. 5. *Monomania of Timidity;* with vague, exquisite terror for its essence: it may be definite and have an object, real or imaginary, frightful or unalarming; or it may have an insuppressible apprehension of present or prospective evil, without any conception of what is feared or why it is feared; and the object dreaded, when there is one, is external and connected with certain persons or events or influences, or it is internal making a part or condition of the disordered mind itself; hence, there is the fear of some persecutor, plot or awful calamity; or the distracted sufferer quails at his own resolves, at what he is, at what he may become. Fear renders the system defenceless against the virulence of contagious diseases; and, while it actually causes many attacks of Insanity, it predisposes to a still greater number. 6. *Monomania of Cunning;* with the wish to conceal, mystify or deceive, impregnated with the suspicion that treachery is practised or designed against the crafty lunatic: he places no confidence in any one friend; he sees a sinister meaning in every act; he gathers insinuations from every word; he is the victim of some plot, the meshes of which surround him, but which he will break through and baffle; he will outwit all machinations; he glories in concealment and insincerity, in circumventing and in assuming an aspect different from the true expression of his feelings; his friends are his dupes; and, while he writhes under the idea of their falsehood and connivance, his delusions revert to schemes by which they may be deceived in retaliation. When cunning is associated with malicious or suicidal intentions, the case is distressing: the design can seldom be frustrated. 7. *Monomania of Superstition;* with an engrossing sentiment of blind devotion and awe, delusions resting upon the relations which the patient holds to the Deity and to supernatural beings, acts of worship really solemn or extravagant or horrible, vision-seeing, miracle-working, and claims to the possession of divine inspiration: the philanthropic monomaniac believes that, as a missionary or a preacher or a prophet, he is destined to achieve the conversion and regeneration of mankind; while, with him that is selfish, his own personal interests and salvation are the cherished concernment: there are few

suicides from superstitious insanity: scepticism produces a greater number of maniacs than enthusiasm. 8. *Monomania of Despondency;* with a loss of confidence in the talents and prospects which had previously been regarded with satisfaction; with an utter abandonment of hope, and a miserable lethargic despair: without delusion or incoherence, there is a settled and dreadful conviction of the approach of ruin and desolation, against which the mind makes no effort, and the sufferer clings to his horded misery: he requires unremitting attention; no ordinary precaution will prevent the success of his designs when these are suicidal; for years, they may be cherished in silence, until the fears and cares of friends are lulled to sleep, and then the fatal scheme is executed. 9. *Monomania of Imagination;* with pretensions or attempts to do every thing, and a delighted conviction that every thing is done in a manner the most exquisite and perfect; with a panting after excellence, and an indefatigable struggling to attain it, in the higher spheres of human exertion. Such a monomaniac lives in an atmosphere where the distorted objects appear to have a gigantic size, a sublime magnificence, a surpassing beauty: with him, every thing is superlative; his refinement would astonish an optimist; he is a trancendentalist. 10. *Monomania of Avarice;* with the twofold propensity to acquire and to hoard, without regard to means and consequences: the avaricious lunatic has all his day-dreams directed to the acquisition of wealth, property or aggrandizement; his air-castles are built of gold; but, though covetous of riches, he is omnivorous, and derives pleasure from receiving or taking any article, without concern about its value; to him, stealing is absolutely delightful; he will rob his fellow-patients in an asylum, seize upon every thing within his reach, and boldly justify his conduct upon the ground that all thus taken is his own; but he makes no use of such acquirements; it is the mere act of accumulating that constitutes his happiness. 11. *Monomania of Miskindness;* with an excess of benevolence and affection, and an over-anxiety for the welfare of the whole of the human race, or for that of acquaintances and friends. That *visionary* who neglects his own duties in order to eradicate poverty and sickness and sorrow from the world, or gives up his soul to anguish because the attempt has failed, and the *mother* who can neither act nor think nor sleep, from distraction for the safety of her children or relatives, because she cannot relieve them from some evil or misery which gives them no annoyance, are *both* instigated by similar morbid feelings. The affectionate monomaniac is a melancholy spectacle: there is a nobleness and magnanimity in

his phrenzy: he strips himself of his clothes, and he starves for days together, in order to supply the fancied wants of his associates: his mind teems with projects to alleviate their condition, or he wanders about declaring that his whole kindred is in misfortune or has been destroyed, and he searches for their mangled bodies in every hole and crevice. He is too often rendered unhappy by the delusions of wretchedness which are ever before him; or, torn by apprehensions for the misfortunes of friends, by disappointment from their want of affection, and by grief for their ingratitude, he commits suicide and expires. 12. *Monomania of Misperception of Relations of Ideas;* with accurate perceptions, clearness and fidelity of the senses, regular suggestions or impulses of the feelings; but without ability to arrange, contrast, compare or analyze the ideas that are acquired; and this is the error which constitutes the present form of monomanical derangement. It results from disorder of the intellectual faculties, whose office is the association or separation of ideas; and, when this disorder becomes predominant, the power of reasoning rightly is overturned or extinguished. The total absence of concord, connexion or sequence in the thoughts, the inability to assort or methodize, before the mind, the classes of ideas according to their qualities and natural order, is the principal feature of this kind of insanity. The incoherence of irrational persons often depends on this cause; but it is the plausible incoherence which seems to have a meaning, could this only be discovered. Men so affected, may continue to mingle with society and to be useful citizens; when confined, so much of the mind remains sound and vigorous, that they may be entrusted with responsible situations in the establishment to which they are consigned. 13. *Monomania of Misperception of Relations of External Objects;* with an intellectual inability to take a right cognizance of these, as reported to the mind by its external senses. It is in combining the faithful communications of sense, that this kind of monomaniacal infidelity is committed: thus, for instance, the idea of a house encompassed with woods may be well defined, but the idea of the relation which the house bears to the surrounding trees, is vague, indistinct or erroneous; the true idea is disfigured by a misconception. 14. *Monomania of Misperception of Qualities of External Objects;* with incapability of perceiving these under their natural conditions, or with the power of doing so entirely suspended: for example, a mind otherwise unimpaired sees a hunting-field where the dogs, horses and sportsmen are all of gigantic or microscopic size, they resemble mammoths or ants at full speed; and the colouring of

the scene is uniform or it is infinitely varied. Individuals thus affected cannot distinguish one tint from another, or they perceive colours in an imperfect or erroneous manner; they experience a great inaptitude to arrange all their visual impressions into one whole: these start up contrary to the will, in irregular succession and as isolated perceptions; so that, besides being a hallucination, the hallucination of such unfortunates is a thing of threads and patches.

MANIA.—This is madness or consummate insanity, and it results from irregular action of all the mental powers. Its ravages are not confined to certain groups of feelings or perceptions, to associations more or less extensive; it implicates the whole. They may not be all equally injured; but so deeply rooted is their perversion as to enfeeble that which it does not overthrow. Ideas are chaotic, in such a case; but, amid the confusion, there may be discerned the struggle of maddened propensities and extravagant feelings, with the jarring of the elements of memory and perception. The recollection of some long-past scene is mistaken for a present impression; there is a want of discrimination between what is reflected and what is felt; the passions are involuntary; anger bursts forth without provocation; sorrow arises the next moment; terror succeeds, without a single cause for alarm; and the paroxysm terminates with the loud hollow laugh of brutal merriment. This is Mr. B.'s most faithful and pathetic outline of maniacal insanity: he completes the sketch, as underquoted:

Here, he adds, " are three things to be considered,—the want of power to control or direct the mental operations,—the absence of all harmony or sequence between these operations,—and the excessive rapidity with which these operations are carried on. In whatever way induced, whether by wine or emotion or disease, excessive activity is known to affect the propensities and feelings by increasing their excitability and by rendering their suggestions intense, irresistible and involuntary; and, in some cases, they become permanent, if the cause continues to exist. Upon the reflective and perceptive faculties, the effect of overacting is altogether different; carried beyond a certain point, it disturbs, impedes or arrests the sound exercise of the understanding. The excited judgment may attempt to compare two facts, but the laws which regulate this step are abrogated. The whole of the intellectual powers are simultaneously active; and, in place of two, there are twenty propositions to be examined, each of these being distorted by the medium through which it arrived, and withal the power to exclude what is extraneous, or the power to perceive what is essential to the examination, neither of them remains. Violent

excitement of the propensities materially contributes to this disturbance, and the process of intoxication amply illustrates the explanation given of the psychological cause of *Mania*—the excessive simultaneous activity of all the mental powers. The drunkard, as he swallows repeated draughts of some exciting liquor, he waxes valiant or vain or generous, under its influence, according to his character. His wrath is fierce, his mirth boisterous, his kindness overpowering: his every sentiment is extreme. This is clearly a description of the irrepressible activity of the lower feelings; but, gradually and in proportion to the augmenting intensity of the emotions specified, the ability to perceive the merits of an opinion is affected, and then the perceptive powers fail, while double vision and erroneous impressions of all kinds follow. The perfect confusion of *Mania* closes the scene: what tends not a little to give force to the comparison here instituted, and to shew that the states compared are strictly analogous except in their duration,—is the great development of physical strength and insensibility to pain, which occur in both states. In most cases, the maniac is furious as well as incoherent: his strength is tremendous, and cannot be restrained by ordinary means. It is not, however, necessarily exerted for malicious purposes; otherwise death and desolation must follow in his track, and the coërcive measures so long recommended might appear to be justified.—These symptoms all bespeak increased activity; but there is also a species of *Mania* with diminished activity. Under this denomination, are included the cases where the feelings are in abeyance or extinct, while the powers purely intellectual are disordered by increased activity. The combination of fatuity of the propensities with incapability of perceiving the relations of ideas or things, will convey a notion of this form of insanity. There is the same incoherence and preposterous grouping of recollections and actual impressions, but there is neither the wildness, nor vehemence, nor irritability, nor terror. The incongruous imaginings which the depressed maniac conceives to be opinions, or his observations on what is presented to his mind, are poured forth volubly; but he has not pride, nor vanity, nor irritability, to be aroused either by external or internal expressions."

These varieties of Insanity are found in every possible state of combination, exhibiting new and characteristic features; but, although it would require a voluminous treatise on the *Philosophy of Insanity* to comprehend a description of these combinations, yet Mr. Browne professes that his object will be attained, if the sketches delineated in his first Lecture shall serve to indicate the most striking distinctions

between the different varieties, and how readily and humanely and profitably a separation of the inmates of Lunatic Asylums, founded on such broad distinctions, could be carried into effect.

Mr. Browne's second Lecture, like the first, has an interrogative title: its subject is—"*What are the Statistics of Insanity?*" This leads him into a very comprehensive but requisite inquiry which he ably prosecutes to a satisfactory conclusion. In the course of his disquisitive observations on the manifold bearings of this subject, he establishes these important propositions. 1. That, in Britain, there are not less than fourteen thousand lunatics, variously distributed. 2. That, insanity is not an inseparable adjunct of civilization; though, with this, come sudden and agitating changes of fortune, vicious effeminacy of manners, complicated transactions, misdirected views of the objects of life, with ambition and hopes and fears which man, in his primitive state, does not and cannot know; but these neither constitute civilization, nor are they necessarily connected with the sources from which it springs. 3. That, insanity has a greater number of victims, in proportion to the population at present existing, than at former periods; and that this relative increase proceeds from the too palpable multiplication of the causes by which Mania is produced: the occupations, amusements, follies and vices of the present race, are infinitely more favourable for the development of the disease, than they had ever previously been with any people of this country. 4. That, there are certain classes of society, and certain courses of life, which are more exposed than others to Insanity, not because they are worldly or wicked, but because they lead to excitement, and tend to the formation of habits of thought and action, inimical to the preservation of mental serenity and health; and that the cultivators of the earth are not so liable to Lunacy as the cultivators of the mind itself; because, from accessary circumstances, the latter are most exposed to have the tranquillity and equilibrium of their mental powers destroyed. 5. That, there are more deranged persons in the wealthy than in the poor classes of society: poverty enjoins a compulsory temperance; it shuts out the longings of ambition; it acquaints mankind with the realities of life, and excludes from the vitiating effects of sentimentalism; and, in that it trains the body to be vigorous, it is favourable in all these respects to the continuance of mental sanity: the agricultural population is to a great degree exempt from lunacy: hereditary talent is the most frequent cause of this disease. 6. That, mental derangement is more prevalent under liberal than under despotic forms of government; but that, in the state, be it monarchical

or republican, wherein the sources of moral agitation are most abundant, there the proportion of insane persons will be highest: the act of liberation is certainly inimical to mental peace; it operates by powerfully affecting the interests of the mass, by calling forth the deepest sympathies, the most ungovernable passions of the human breast. 7. That, the most useful and active period of life, that between thirty and forty, is more exposed than any other to the incursions of lunacy; and its activity is the predisposing cause: all the mental energies are then excited, the affections find objects, the passions are roused; and, if there be a weak or imperfect part of man's nature, it is then shaken and may be cast down in the struggle for subsistence, or for wealth, or for power, or by the anxieties which too frequently arise in the even tenour of the most humble and unambitious career: but no age is exempt from this deplorable calamity; for infants and octogenarians do become insane. 8. That marriage, with the peace and happiness which it secures, affords a protection from insanity, either by removing individuals from the influence of existing causes, or by the formation of regular habits and the cultivation of virtuous impulses, thereby rendering that influence innocuous. To woman marriage is, or ought to be, the point to which all her wishes have previously converged, and from which all her future hopes and happiness are to emanate: to man it is the shield against himself and his passions; he seeks in it, and he finds joy, solace, and support, when these fail of being furnished by his own thoughts or avocations, or by the world. When founded on harmony of dispositions, marriage creates the capabilities of enjoying comfort, and of enduring pain; it neutralizes selfish feelings and pleasures; it prevents the mind from retiring on itself; it acts as a barrier against hidden sorrows; it gives employment to his noblest qualities; and, while checquered by the ordinary vicissitudes of life, because it naturally yields no strong, or sudden, or permanent excitements, it is a powerful antidote to insanity. 9. That females are more subject to mental derangement than men, both before and after marriage; and that the causes of this are constitutional peculiarities, delicacy of frame, susceptibility of mind, and imperfect or vicious education. In many instances, this tends to arrest the development of the body; it overtasks some of the mental powers, and leaves others untaught; it is directed to the encouragement of sordid and selfish feeling; it substitutes a vapid affectation for a knowledge of the realities and duties of life; and thus, instead of imparting strength and stability, it becomes the fertile source of debility and decay. 10. That, un-

der the existing modes of management, about one half of the insane patients are cured; that insanity conduces materially to the shortening of life; and that the autumn and winter usually prove by far the most fatal seasons to lunatics—a fact which shows the necessity of always protecting them effectually from the ungenial influences of the atmosphere and its sudden alternations.

Mr. Browne adds to the foregoing propositions, a train of highly valuable observations on the diseases wherewith lunatics are apt to be affected; on the proportions of furious, paralytic and epileptic, fatuous and idiotic, dirty and noisy, and suicidal madmen; on lucid intervals and relapses; on complete isolation, early confinement, and employment as a means of cure; on the proportion of lunatics that may be employed; on the kinds of occupation to be adopted; on its safety; and on its share in promoting the cure.

Never was there a more faithful or a more frightful representation of concentrated horror delineated by the hand of man, than is the picture of "*What Asylums were*," as exhibited in Mr. Browne's third Lecture: but thanks, immortal thanks be to the new philosophy of mind, for the blaze of divine enlightenment, wherewith it is now reviving and purifying these heretofore misused establishments. Until this burst forth, as Mr. B. declares in terms of perfect truth and eloquence, a thick and almost impenetrable veil was cast over the workings of the "mind diseased;" a sort of awe and sacredness was attached to the person of the maniac, as one on whom had fallen the hand of his Creator, visibly and fearfully, and in a peculiar manner; the precincts of his prison-house were regarded as holy and interdicted ground; and the secrets of that mysterious dwelling remained untold, or were whispered in accents of dread and reverence; but the day-spring of knowledge which is fast diffusing its cheering light on every the most distant land, has visited even the benighted sky of a mad-house, and fallen with healing energy on the hearts of those whose doom, in other days, must have been imprisonment, solitude, and despair. Pass we now, from this to a brightening scene.

"*What Asylums are*," as a topic of discourse, engages Mr. Browne's attention throughout his fourth Lecture; and, at the outset, he candidly admits that great improvements have been effected in the internal economy of these institutions. He then ascribes this result partly to selfish motives, partly to the prevalence of sounder views of the nature and treatment of mental disorders, and chiefly, so far as the metropolitan establishments are concerned, to the dread of parliamentary investigations, and the surveillance and remonstrances of the

medical commissioners. His next step is to shew that the old system, with its enormities, is not yet (May, 1837) altogether exploded; that the ameliorated system commenced with the liberation of lunatics from the Bicêtre of Paris, in 1792, by the venerated Pinel, whose memory will remain enshrined for ever in the temple of heroism and philanthropy; and that, though the adoption of enlightened principles be partial, yet the desire for improvement is steadily becoming more and more prevalent.

Mr. B. notes a cursory record of the fact, which is remarkable, that it was in Egypt and Belgium, in remote times, where the recognition of humanity and occupation was first adopted as a means of treatment for the insane. Next, he adduces evidence to prove that the existing method of managing them is characterised by want of classification, want of employment, and want of bodily exercise. He then exposes the error which leads to Asylums being imperfectly heated, and the error of supposing that lunatics are impregnable to cold, and the mischievous error of habitually disregarding their personal comfort.

With much justice and good feeling, Mr. B. complains that, though corporal punishment is now professedly discontinued, yet cruelty in various forms is still committed on the inmates of mad-houses; that patients are sometimes confined to bed for the accommodation of servants; and that the number of keepers is often inadequate. His remarks on coercion are pertinent and practical, suggested by enlightened humanity, and confirmed by experience.

Attendants on the insane ought to be preferred for their character and qualifications: on this account, Mr. B. has taken great pains in defining the rules by which these persons should be selected. Having pointed out the evils of an indiscriminate association of lunatics and the grounds for separating them, he proceeds to expose the erroneous views too generally entertained respecting their moral treatment, and the great disadvantages occasioned by the want of wards for convalescents. He would not invest the commissioners for regulating Asylums with the power of visiting all such houses in the night. A proposal for adopting a measure of this kind was negatived by the legislature, in consequence of the almost unanimous opposition of the medical men who were consulted on the subject; but, he observes, such a proposal indicates two things—a total and unjust want of confidence in the probity and competency of the managers of these institutions, and a complete want of knowledge of the interests of the insane. Such visits might disclose some of the evils which it were

desirable to have corrected, but it would undo all that which quiet and care had effected, by rousing every inmate to fear or fury, and thus realizing the delusions which sleep so often weakens or eradicates.

Mr. Browne is of opinion that mental anxiety and disturbance in the insane are produced or aggravated by the oppressive, harsh, indelicate and derisive conduct of keepers, and he holds it up to well-merited condemnation. For this kind of servants, but with proper discrimination, he would substitute convalescent patients: nevertheless, he does not lose sight of the important duties necessarily entrusted to such attendants, or of the difficulty of procuring well-educated persons to undertake their immense responsibility.

This lecture is completed with judicious and instructive remarks on the seclusion of lunatics, and their desertion by friends; on the unfitness of asylums for the reception of the rich; on luxurious and indiscriminate diet; on solitary meals; on the public prejudices which present obstacles to improvement in the economy of such institutions; and on the means by which these obstacles may be removed. To accomplish this last end, Mr. B. concludes, it would become necessary that all asylums should be public, and under the control of government or of parties incorporated by charter for the purpose. The great object in such a change would be, that all the proceedings of those immediately entrusted with the insane should be open to the public and to the legal authorities, and under the management of a body whose sympathies are engaged in favour of the patient rather than of his attendants. Render County Asylums perfect, elevate all of them to the rank which a few now enjoy, give them the means and the reputation of curing ninety instead of forty-two in a hundred, and increase their opportunities of affording protection and happiness to those who cannot be further benefited, and then the number of private institutions would speedily decrease; and, if the improvement were pushed sufficiently far, they would probably cease to exist; or, should this result not ensue, they must adopt the system pursued by their rivals; and, this being done, it would effect all that is desired or desirable.

Lecture the fifth demonstrates, clearly and perfectly, "*What Asylums ought to be*," according to Mr. Browne's judgment and experience. He requires that the character of a physician to an institution of this kind, should be distinguished by benevolence, conscientiousness, courage, and high intellectual attainments highly cultivated, which he enumerates with amazing truth and eloquence. In his

mind, and rightly, the site of an asylum ought to be a subject of urgent importance: every care should be bestowed on the selection, with reference to salubrity: it should possess the advantage of a dry cultivated soil, with an ample supply of water: and it should be so far removed into the country as to have an unpolluted atmosphere, a retired and peaceful neighbourhood, and yet be so near a town as to enjoy the comforts and privileges and intercourse which can only be attained in large communites. If the building be erected upon the summit or the slope of an eminence, the advantages are incalculable: to many, whose intellectual avenues to pleasure are for ever closed, the mere extent of country affords delight: to some, the beauty of wood and water, hill and dale, conveys grateful impressions: to some, the inanimate objects, the changes of season, the activity of industry, the living and moving things which pass across the scene, form a strong and imperishable tie with the world and the friends to which the heart still clings: and to all, a succession of new and varied and salutary impressions must be communicated. His plan for the construction and arrangements of an asylum, as regards the security and comfort and cure of its inmates, is quite graphic, and seems preferable in all its details. He would make it fire-proof, pad the walls, and heat the apartments by the circulation of hot water: he would surround the place with airing-grounds, shrubberies, and gardens; give the patients warm clothing, exercise them in farm-employment, and pay them for their labour—not in money, but with such objects as may be judged most acceptable to the patients, so as to gain their good-will and confidence.

Mr. Browne recommends the admission of insane persons to religious worship and instruction; not indiscriminately, however, but under careful and prudent selection. Upon certain forms of mental disease, he believes, religious teaching or ceremonies would act as a direct irritant; upon others, they would fall powerless; upon a third class, such instruction would operate as any other new scene or occupation which assisted in relieving the monotony of their mode of life; while, upon others, their influence would be altogether benign, affording a legitimate gratification to healthy feelings, directing the mind from depressing or agitating, to soothing associations, and tending to inspire with brighter and nobler hopes which disease can neither darken nor quench, which will beam on the troubled spirit amid its gloomiest delusions, as clear and certain points of guidance, like shore-lights to the storm-bound mariner. In his opinion, it is upon

the discrimination of the patients to whom religious instruction is adapted, that the whole question of its utility rests.

Having exhibited in full detail, the entire economy of a Lunatic Asylum "*as it ought to be*," and having proved, by numerous extremely interesting facts and reasons fairly based on them, that his principles are sound and his conclusions practicable, Mr. Browne completes the lecture with a representation of an establishment which presents a very decided resemblance to the institution that prospers vigorously under his own superintendence.

"In place of multiplying individual examples of excellence," he says, "let me conclude by describing the aspect of an Asylum as it ought to be. Conceive a spacious building resembling the palace of a peer, airy, and elevated, and elegant, surrounded by extensive and swelling grounds and gardens. The interior is fitted up with galleries and work-shops and music-rooms. The sun and the air are allowed to enter at every window; the view of the shrubberies, and fields, and of the groups of labourers, is unobstructed by shutters and bars; all is clean, quiet, and attractive. All the inmates seem to be actuated by the common impulses of enjoyment; all are busy, and delighted in being so engaged. The house and all around it appear as a hive of industry. When you pass the lodge, it is as if you entered the precincts of some vast emporium of manufacture; labour is divided, so that it may be easy and well performed; and so apportioned that it may suit the taste and powers of each labourer. You meet the gardener, the common agriculturist, the mower, the weeder, all intent on their several occupations, and loud in their merriment. The flowers are tended and trained and watered by one, the humbler task of preparing the vegetables for the table is committed to another. Some act as domestic servants, some as artizans; some rise to the rank of overseers. The bakehouse, the laundry, the kitchen, are all well supplied with indefatigable workers. In one part of the edifice are companies of straw-plaiters, basket-makers, knitters, spinners, among the women; in another, among the men, are weavers, tailors, and shoemakers. For those who are ignorant of these gentle crafts, but are strong and steady, there are loads to carry, water to draw, wood to cut; and, for those who are both ignorant and weakly, there is oakum to tease and yarn to wind. The curious thing is, that all are anxious to be engaged, toil incessantly, and in general without any other recompense than being kept from disagreeable thoughts and the pains of illness. They actually work in order to please themselves, and having once experienced the possibility of

doing this, and of earning peace, self-approbation, the commendation of all around them, sound sleep, and sometimes a small remuneration, a difficulty is found in restraining their eagerness and moderating their exertions. There is in this community no compulsion, no chains, no whips, no corporal chastisement, simply because these are proved to be less effectual means of carrying any point than persuasion, emulation, and the desire of obtaining gratification. But there are gradations of employment. You may visit rooms where there are ladies reading, or at the harp or piano, or flowering muslin, or engaged in some of the manifold ornamental productions in which the female taste and ingenuity are displayed. You will encounter them going to church or to the market; or returning from walking, riding, and driving in the country. You will see them ministering at the bed-side of some sick companion. Another wing is occupied by gentlemen who can engage in intellectual pursuits, or in the amusements and occupations of the station to which they belong. In all probability, the billiard-room will present an animated scene. Adjoining apartments are used as news-rooms, and the politicians will be there, under restrictions from disputation. You will pass those who are fond of reading, drawing and music, scattered through handsome suits of rooms, furnished chastely but beautifully, and looking down upon such fair and fertile scenes as harmonize with the tranquillity that reigns within, and tend to conjure up images of beauty and serenity in the mind which are akin to happiness. But these persons have pursuits, their time is not wholly occupied in the agreeable trifling of conning a debate, or gaining so many points. One acts as a transcriber, another is engaged in landscape-painting, a third undertakes a course of historical reading and submits to examination on the subject of his studies, and a fourth seeks consolation from binding the books which he does not read. All, in short, are so busy as to overlook, or are so contented as to forget, their misery."

With the preceding account of his Lectures for testimony, it may be affirmed that this work of Mr. Browne's is excellent in all respects: both in design and execution, it justly merits the highest commendation: to general readers, it discloses and offers a rich treasure of philosophical and medical instruction: and it is with extraordinary zeal, as well as extraordinary success, that he has executed his self-allotted endeavours to excite and guide the sympathy of those who are blessed with a sane, a benevolent, and a cultivated mind, to assist in ameliorating the condition of their fellow-beings who may be suffering the afflictions of Insanity. He has been the first to engage in an

attempt to condense, in a plain and practical, *but still popular*, form, the results of observation on the treatment of Mental Derangement, for the specific and avowed purpose of demanding from society an associated effort to fulfil this duty, so distinctly enjoined by the divine ordinances of reason and religion. The purity and disinterestedness of his motives are evident upon every page of his volume: and they evince clearly that, in conducting a very careful and candid examination of his subject, he has been actuated by a profound sympathy for the misfortunes of the insane, and with a keen feeling of indignation that these misfortunes should often be multiplied through the apathy, or the ignorance, or the cruelty of those who have it in their power to become benefactors in the noblest cause that can arouse a virtuous emulation.

THEORY OF THE PRICE OF CORN.

I ASSUME that it is the great and beneficial purpose of periodical works, which profess to be devoted to the diffusion of knowledge, that they should not only be employed in the publication of established facts and new discoveries, but that they should, under suitable restrictions, be made the vehicles of speculation, the media of liberal controversy where opinions may be adverse or disputable.

Under this assumption, I venture to solicit a space for the following communication, to which I wish to call the special attention of political economists, and still more especially that of the enlightened portion of agriculturists. I am happy to observe that this class of the community is increasing, and that they must shortly occupy that intellectual position which their primary importance requires: not that I think the statement here advanced of exclusive import to these classes, but that it will be found worthy of the regard of all ranks and interests.

Mr. John Taylor, an acute, sober, original, speculative writer, has, in a small work entitled *A Catechism of the Currency*, introduced a chapter On the Theory of the Price of Corn, which contains the following (to me) novel facts.

In this work it appears that there is a steady fixed *natural* price of wheat, which, in reference to the precious metals, did for a

length of time, and over an extensive region of various countries, maintain an extraordinary uniformity or equality. To make this intelligible I shall give the details, with a view to extend the range of their publicity, and still further to expose them to that rigid scrutiny which shall either determine the fallacy or solidity of the theory therein deduced.

The *natural* price of wheat is thus ascertained and established:— It appears that "the labour and skill employed in bringing to England from its native mines the quantity of gold and silver contained in 33*s.* 6*d.* is supposed to be equivalent to the labour and skill employed in producing and bringing to market from the soil of England one quarter of the finest wheat: because that sum is found to be the price of a quarter of the finest wheat in this country, taking the average of a number of years under the lowest amount of taxation, and because it is also found to be the price of the finest wheat in the continental markets, taking them one with another, for a series of years."

Are these statements hypothetical or true; suppositious or demonstrable; contingent or inevitable? The beauty, utility, and permanence of the superstructure must depend on the solidity of the foundation.

To continue the quotation:—"To this *natural* price of wheat must be added that degree of *artificial* price which is called for by the taxation to which the English farmer is subject. Supposing that taxation to be estimated by the amount, for the time being, of the national debt, it appears, from the price which has been paid for corn since the commencement of the debt, more than a century ago, that 1*d.* per quarter for each million of debt is required to be added to the *natural* price (33*s.* 6*d.*), in order to give the English farmer as fair a remuneration, *with* taxation, as 33*s.* 6*d.* is *without*. The following statement will show that this addition is not too large an allowance:—

"At the Revolution in 1689, the national debt
was below a million; viz., ... £ 664,263
In 1697 it amounted to..... 21,515,742
1701 it was reduced to..... 16,394,701
1715 it was increased by war to 53,681,076
1739 it was reduced by peace to 46,954,623
1748 it was raised by war to 78,293,313
1764 it was raised by war to ..... 139,516,807."

I shall continue the statement in the author's own words:— "From 1689 to 1764 the price of the finest wheat should have

risen from 33*s.* 6*d.* to 45*s.* 2*d.* per quarter to keep pace with the debt. According to the audit books of Eton College, 33*s.* 10*d.* was paid in 1688–9 and 44*s.* 9*d.* in 1763–4!

"But these prices, it may be said, may have been accidently coincident.

"Let, then, the average of each period of the debt be taken, and the mean of all the averages. This gives for the whole period of seventy-six years, from 1689 to 1764, a price of 37*s.* 6*d.* per quarter, and the average price for the same term paid by Eton College was 37*s.* 9*d.* per quarter!

"In 1775 the debt was reduced to.....£129,146,322
1784 it was raised by the American war to 249,851,628
1793 it was reduced to 239,350,148

This last sum required the price of 53*s.* 6*d.* per quarter, and the price paid by the College was 54*s.* 4*d.* for 1792–3! Taking the average of each of these periods, and the mean of the three sums, the price ought to have been for the twenty-nine years, from 1765 to 1793, 49*s.* 4*d*; and the price paid on an average of the whole term by the College was 49*s.* 5*d.*!

"During the late war, the debt rapidly increased, especially after 1797, and the price of corn rose with it, at one time higher than its just proportion, owing to our obstructed intercourse with the continent; but in the long-run the debt overtook it, so that it did not finally exceed its proper limits. The debt was highest in 1816, when £864,822,540. required the price of 105*s.* 6*d.* per quarter, and the price paid by the College in the two years following was 107*s.*! Taking the average of every year of the debt, from 1794 to 1820, in which latter year it was £843,388,804., the price required for these twenty-seven years was 87*s.* per quarter, and the price paid by the College was 87*s.* 10*d.*! For a part of this time, viz. twelve years from 1809, when the debt was £650,013,362., to 1820, when it was £843,388,804., the average required was 97*s.* 8*d.*, and the price paid was 98*s.* 9*d.*! To sum up the whole briefly, the comparative result stands thus:—

"SINGLE YEARS.

	s.	*d.*		*s.*	*d.*
"Price required in 1689	33	6	Price paid in 1688–9.....	33	10
Ditto ditto 1764	45	2	Ditto ditto 1763–4.....	44	9
Ditto ditto 1793	53	6	Ditto ditto 1792–3.....	54	4
Ditto ditto 1816 105		6	Ditto ditto 1817–8.....107		0

The entire difference being 2*s.* 3*d.*, averaging about 7*d.*

AVERAGE OF LENGTHENED PERIODS.

Average required for	s.	d.	Average paid for	s.	d.
76 years, from 1689 to 1764...	37	6	76 years, from 1689 to 1764...	37	9
29 years, from 1765 to 1793...	49	4	29 years, from 1765 to 1793...	49	5
27 years, from 1794 to 1820...	87	0	27 years, from 1794 to 1820...	87	10
12 years, from 1809 to 1820...	97	0	12 years, from 1809 to 1820...	98	9

The entire difference, 2*s.* 11*d.*, averaging about 9*d.*; difference of 132 years, 1*s.* 2*d.*, averaging not quite 5*d.*"

I make no apology for the length of the previous quotations. To abridge, would have been to mutilate them. There stand the facts on which Mr. Taylor's theory rests. Whether the inference he has drawn be correct and legitimate or not, I presume not to determine. That a coincidence in the totals and a series of coincidences in detail, should have proved so undeviating through a period of upwards of 130 years in all the various states of peace and war, good and bad seasons, plenty and scarcity, restriction and free importation, &c. &c., without some intimate connection of cause and effect, is an astonishing, almost miraculous circumstance, scarcely to be parallelled. Should they be the result of mere chance, it may be asked, through what duration of time must a regular order of concurrent events pass, which shall warrant the unquestionable conclusion of their being connected as cause and effect? On the other hand, in this case, it may be asked, are there any discrepancies in that extended period sufficient to counterbalance the concordances herein stated, or to impeach the correctness of the deduction? These I confess are moot points that appear to be worthy of the strictest investigation. Strong as the presumption is in favour of the theory, and much as it may be wished to be true, still it *may* be unsubstantial. Its truth or fallacy ought to be ascertained beyond a doubt. If it be established it will confirm, above all dispute, the propriety of holding to a quarter of Wheat as the most steady *standard of value*. Would that we could obtain a *measure of value* equally inflexible. This appears to be a *desideratum*, but is it attainable? And, if attained might it not help to put an end to those periodical visitations of panic which occasionally convulse the mercantile world? If such would be the result what efforts ought not to be perseveringly pursued, until the benefit be secured. Agriculturists, manufacturers, merchants, are all equally interested in so desirable an acquisition.

Stedfast and uniform as the mutual increase continued during 130 years, it has been for some years and is now very seriously dis-

turbed. This disturbance, which has proved a weighty and continued injury to the farmer, M. Taylor attributes (justly or not, I pretend not to decide) to Peel's Currency Bill; for the repeal or modification of which, he is an ardent and powerful advocate.

On taking a retrospect of the progress of the debt, it may be noticed, that it receded or diminished at four distinct periods during the epoch of 130 years. These recessions in each of the two latter instances amounted to upwards of ten millions, and appear to have been effected at the rate of about one million per annum. It may be naturally asked, was this slow and small recession followed by a correspondent diminution in the price of wheat? An affirmative answer to this would evince the extreme subtlety of the connexion, and of course strengthen the assumed theory. A negative answer would by no means invalidate it, the difference being only ten-pence a quarter or about one fifty-fourth part of the then current price, a change which might be counteracted by temporary causes. It is also possible that by the time the effect could be produced, a reflux might have taken place.

I confess that I feel myself somewhat bewildered if not enthralled by this specious theory; at the same time I cannot overcome some sceptical doubts of its truth. Gainsay the statements, and the theory perishes. If they be proved to be correct, it will not absolutely ensure its stability. There is, in that case, a bare possibility, that the concurrence, long, intimate, and regular as it appears, may not be invariably linked. In this maze of perplexity, I cannot come to a satisfactory decision. I wish I could.

I must here close these desultory remarks. My primary object is to give Mr. Taylor's project a wider expanse of publicity; I hope for his benefit, by exciting a curiosity to peruse the whole work, which, independent of the foregoing ingenious and original speculation, abounds with others equally admirable and interesting.

I trust among the numerous and intelligent readers of *The Analyst* some will be found who will subject the theory to the severest inquisition, and give us the result; that the question may be set at rest. If my communication produce this effect alone it will do good, and my time will not be wasted. If the various queries and suggestions I have thrown out on this dry but important topic should elicit further communications, still more benefit will result to the public; my purpose will be gained, my ambition gratified.

G. B.

OBSERVATIONS ON THE DIFFUSION OF SCIENTIFIC KNOWLEDGE IN LARGE TOWNS.*

By E. P. Blakiston, M. D., of Birmingham.

There are certain periods in the lives of all men, when it would seem to be no less advantageous than proper to review their past actions and scan their present position, for the purpose of examining whether they have been drawn aside from those principles which their judgment has approved, and whether a change of situation may have called for new duties which it is important they should not neglect. This self-examination, which has been considered by the wise and good of all ages as wholesome and necessary to individuals, is no less so to public bodies or classes of society, and would seem to be especially required on the part of the influential inhabitants of this town at a time when it is on the eve of becoming the centre of inland communication, and when we are called upon to prepare for the reception of a most distinguished scientific body, which may be expected, at no distant period, to hold its meeting here. Allow me then, for a few moments, to direct your attention to the past and the present state of this place.

In reviewing the events of the last thirty years, we cannot but be struck with the extensive changes that have taken place. Engine after engine has been erected, manufacture after manufacture introduced. Places of public worship have been multiplied, and splendid edifices have risen within the town itself, while its environs have become studded with elegant and substantial dwellings. The abodes, too, of the humbler classes have undergone material improvement, so that, as regards their ventilation, cleanliness, and convenient arrangement, they vie with, if they do not surpass, those of any other town containing an equal population.

These are strong proofs of the increase of riches and prosperity. Immense wealth may not have been accumulated by individuals, but (which is better) there has been a large addition to the number of those who, by their industry and talents, have raised themselves to independence and comfort. The number and extent of the societies which have risen up for the encouragement of the arts or the ad-

* A Lecture delivered at the Birmingham Philosophical Institution.

vancement of science, show that taste and refinement have in some measure kept pace with the increase of comfort and wealth.

Satisfactory as is the improvement in these respects, it is less important than that which has taken place in the moral character of the working classes. Within the memory of many, their meetings were characterised by a fearful spirit of violence and outrage. With two exceptions, however, one of which, I am sorry to say, was recent, and which cannot be too deeply regretted or too strongly condemned, no loss of property has resulted from their assemblage in periods of excitement or distress, during the last thirty years. This improvement in the feelings and habits of the labouring classes is further shown by the increase in the amount of deposits in the Savings' Bank, and by the number and extent of the provident institutions now existing—proofs the most conclusive that could be adduced.

It would be an interesting task to trace the various causes that have concurred to produce such beneficial effects as those which I have enumerated; but it would be foreign to my present purpose to do so: one or two, however, of the most obvious must not be omitted. It will at once be acknowledged by all, that the great increase of our manufactures and riches has mainly and directly flowed from the improvements in the Steam Engines effected by the late Mr. Watt, whose name will always be had in honour among all who are capable of appreciating the benefits derived from his persevering ingenuity. By this means the natural product of the neighbourhood, Coal and Iron, were at once turned to a much larger account than they had ever been. But this direct cause arose out of another more extensive in its operations, I mean the diffusion of knowledge. At the time he made the discovery which led to his improvement in the Steam Engine, Jame Watt was residing as a mathematical instrument maker at Glasgow, where the diffusion of scientific knowledge had made some progress, and where he had come within its range, and had thus been prepared for making the discovery which led to such stupendous results.

Again, it is well known that for many years the children of the working classes of this town have been highly favoured with the means of religious instruction; and this will be said to be the chief cause of the moral improvement that has taken place amongst them. Unquestionably it is. Religion is the highest branch of knowledge, that which supplies us in the pages of Revelation with a sure guide during life and a bright hope in death. And here I cannot withhold the meed of praise from those persons who, at an early period in the history of Sunday Schools, were so deeply impressed with their im-

portance and utility, that they established them in this town on an extensive scale. To the end of time their beneficial effects will be felt.

The history of man in all ages and countries forbids our attributing the happy change I have alluded to as having taken place in the conduct of the working classes when assembled in periods of excitement or distress, to the counsels or restraining influence of others, for even the most heroic self-devotion, and the most fervid eloquence, have failed to allay the fury of an excited populace devoid of education. No: the cause is to be found in the moral improvement which has taken place among the mechanics themselves—the result of education; which, while it has enabled them better to discriminate between sophistry and truth, and between declamation and argument, has assisted them to restrain their passions, and has taught them to respect the laws.

But the position of individuals or communities is not merely to be judged of by what it has been, but by what it ought to be; and we must constantly endeavour to bring it nearer and nearer to such a standard; enquiring whether additional exertions may not be required in order to secure and increase the advantages already attained. Thus, the present state of this town looks well when compared with the past. But is it not still very far from what we could wish it to be? Has the increase in the number of the places of public worship kept pace with that of the population? Are the scientific institutions conducted on a scale suited to so large and important a town, and furnished with well-stored museums, accessible to all classes? Are we surrounded by airy and pleasant public parades, in which the mechanic and his family can enjoy wholesome and innocent recreation? Do we still encounter profligacy and drunkenness in our streets? and do not their appalling effects fall under our daily observation? Is not the town, at this moment, swarming with the victims of improvidence? And are not a large number totally unacquainted with a knowledge of even reading and writing, the tools necessary for working out mental improvement? There remains obviously much to be done, to which what has already been accomplished bears but a small proportion.

I have alluded to the probability of our town being visited before the expiration of two years by an assemblage of eminent men connected with the British Association for the Advancement of Science. While they will contemplate with interest our growing manufactures and our stupendous railroads—while they will gaze with delight on the architectural beauties displayed in two of the most chaste and elegant buildings of the age, and while they will recall to their minds the phi-

losophical labours of Priestley and of Watt—they will not fail to enquire what steps we are taking to elevate the mass of the population below us by the diffusion of the knowledge which has already been acquired, and what facts we are collecting which may serve for the discovery of new truths in the various departments of science.

I have said, too, that this town is on the eve of becoming the centre of inland communication, by the completion of that stupendous work, the Railway between Liverpool and London; and this, there can be little or no doubt will soon be followed by others which will ramify to all the principal points of the island. It is impossible to hazard a conjecture as to the whole effect this may have upon our town, or to assign a limit to the importance which it may thus attain. At this moment the eyes of all are directed towards it; and strangers will soon flock in from various quarters, and they also will inquire into the progress we are making in the work to which I have alluded.

In the slight sketch which has thus been drawn of the past and present state of this town, the effects of the diffusion of knowledge may be clearly traced in the improvement which has taken place, and we may therefore naturally expect that the future advancement of civilisation may be much hastened by the same means. The importance of the subject, then, coupled with the fact that we are about to be put upon our trial before a tribunal of Science, renders an apology for bringing it under your notice on this occasion unnecessary. It may be said that none *now* dispute the utility of knowledge, either on moral or political grounds. But, alas! we do not always practice what we know to be useful and right; few deny the authority of Revelation, but many neglect to follow its injunctions. We require "line upon line, and precept upon precept."

There are some amongst us who have long felt the importance of this subject, and have been long labouring to elevate the moral feelings, and improve the minds and habits of the working classes. I cannot hope to teach such persons, but I may perchance strike a corresponding chord in their minds, and recall by association long forgotten, trains of pleasurable feelings, while I enlarge upon the *advantages, duty, and means of diffusing scientific knowledge.*

I.—Among the *advantages* arising out of the diffusion of knowledge, those which are attendant on religious instruction are too obvious and too fully acknowledged to require any demonstration. The knowledge of the will of Him to whom we owe all our blessings, is indeed an advantage which puts all others far out of the reach of comparison. It is not, therefore, as undervaluing its importance that

I do not now dwell more particularly upon this subject, nor would I forget for one moment, nor have any who do me the honour to listen to me forgot, that Science is most useful and most honourable when she appears as the hand-maid of Religion. In this connection, and in this subordination, so to speak, I proceed to treat of scientific knowledge, as explaining the phenomena of Nature and the duties of society.

The manual labour required in most trades may be performed by persons perfectly unacquainted with the laws of science, and even some kinds of mental labour may be accomplished by the same class of persons, as has been well shown by Mr. Babbage, in his work on the *Economy of Manufactures*. Those, however, who arrange and plan the work must know something more; and those who invent processes or machinery must be acquainted (practically at least) with those laws of science on which their conclusions depend. Thus, the most eminent mathematicians formed a Section for the purpose of determining the best formulæ for the famous French Logarithmic Tables; these formulæ were then delivered to a second Section, tolerably well versed in mathematics, who, having turned them into numbers, handed them over to the last Section for completion by simple addition. It is evident, then, that for all but the commonest purposes, scientific knowledge must be advantageous. There is not a domestic process, however simple, in which some scientific principle is not involved, and in which, consequently, an acquaintance with such principles may not prevent an error or suggest an improvement. A farmer having once manured his land with lime was surprised to find a decrease in its produce. He mentioned the circumstance to a gentleman acquainted with chemistry, who, having procured some of the lime, submitted it to analysis, by which means he discovered that it had been made from magnesian limestone. The cause of the failure in the produce of the land became immediately apparent, magnesia being injurious to the growth of vegetable substances on some soils. The great French chemist, Lavoisier, took a quantity of land into his own cultivation, and having analysed the soil, and applied such substances to improve its quality as his chemical knowledge suggested, he succeeded in doubling its produce in a short time.

Thus, were the knowledge that *now* exists generally diffused, and did it penetrate to the lowest grades of society, we might expect that the land of the farmer would become more productive, and that the goods of the manufacturer would be better made; in short, that all those articles which minister to the wants and comforts of man

would be produced of a better quality and in greater abundance than they are at present.

Again, the diffusion of present knowledge may be expected to lead to *new discoveries*. By this means the number of philosophical inquiries is increased; for although the desire for knowledge may at first be small, yet it soon increases, and finds no such gratification as in the discovery of new truths. Some persons, however, have a natural aptness to invent; and were they not made acquainted with what is already known, they would be continually directing their thoughts and efforts into channels which had been previously explored. It is by no means uncommon to witness the display of very great ingenuity and talent on the part of a mechanic, in the invention of a process or a piece of machinery which has already been some time at work in a distant part of the country. Such a misdirection of talent and industry would be prevented by the diffusion of scientific knowledge. But, perhaps, its greatest value consists in its preparation of the working classes for becoming discoverers. To use the language employed in the preliminary treatise of the Library of Useful Knowledge, "It gives every man a chance, according to his natural talents, of becoming an improver in the art he works at, and even a discoverer in the sciences connected with it. He is daily handling the tools and materials with which new experiments are to be made, and daily witnessing the operations of Nature, whether in the motion and pressure of bodies, or in their chemical action on each other. All opportunities of making experiments must be unimproved, all appearances must pass unnoticed, if he has no knowledge of principles; but with this knowledge he is more likely than any other person to strike out something new which may be useful in art or curious and interesting in science. Very few discoveries have been made by chance or by ignorant persons; much fewer than is generally supposed." The writer, after adducing proofs of this, and referring to discoveries made by persons of competent knowledge who were in search of them, adds, "In so far as chance has any thing to do with discovery, surely it is worth the while of those who are constantly working in particular employments to obtain the knowledge required, because their chances are greater than other people's of so applying that knowledge as to hit upon new and useful ideas; they are always in the way of perceiving what is wanting, or what is amiss in the old methods, and they have a better chance of making the improvements. In a word, to use a common expression, they are in the way of good luck, and if they possess the requisite information, they can take advantage of it when it comes to them."

It is thus that many great inventions have been made, and that many great men have raised themselves from very humble stations —Arkwright, John Hunter, and Sir Humphrey Davy are striking examples. Is it not reasonable to expect that such instances will be multiplied, as scientific knowledge is more extensively diffused? This town contains a vast number of artisans whose superior intelligence and activity have raised them above their fellows. Such men are exactly in a situation to profit by any scientific information which may be thrown in their way. Endowed by Nature with quickness of apprehension, receiving fair wages, and not so fatigued with their daily occupation as those occupied in the drudgeries of the manufactories, they have some time, money, and talent to bestow upon the cultivation of science.

From the labours of such men as these much good may arise to our town, and much evil may be warded off from its trade; for from them may originate such improvements in machinery and in the economy of manufactures as shall enable us to retain that place in the great markets of the world which we have so long held, but from which some think we may be one day driven by foreign competition.

But scientific knowledge, in penetrating to the working classes, must pass through that of manufacturers; and it is to be hoped that, like light traversing diaphanous bodies, it may leave some of its rays behind it; for among this class have arisen great discoverers. Two elementary substances, iodine and bromine, were respectively discovered by a manufacturer of saltpetre and a working chemist; and it was Dolland, the optician, who, finding that a lens made of one kind of glass decomposed the white light that passed through it into its primitive colours, the distances between each of which were greater than when it passed through one made of another kind of glass, formed such a combination of these different lenses that the light which had been decomposed by some was recomposed by the others, with only a partial loss of the refraction, by which the apparent sizes of objects are increased. He thus succeeded in producing magnifying glasses through which the light passed to the eye in a state of achromatism, *i. e.* devoid of colour; a circumstance which Newton had supposed could never take place. The French are fully alive to the advantages which must result from their manufacturers receiving a scientific education. There are, in Paris, no less than three public laboratories, furnished with the most costly apparatus, and superintended by the first chemists of the age, which are open to all those students who by their industry and good conduct have

rendered it probable that they will make a good use of such advantages; and in the private laboratories of that city are to be seen numerous students who are destined for those trades in which a knowledge of chemistry may be in the remotest degree useful. The most brilliant examinations in chemistry are said to be passed by young men in this class of embryo manufacturers. A country which thus holds out encouragement for the cultivation of science by all classes, not merely in the one department to which I have more especially alluded, but in all, may well boast of having raised many philosophers from the humblest ranks of life.

We have now to notice another advantage arising from the diffusion of knowledge—the improvement of the mind, feelings, and habits. This is an effect which knowledge can scarcely enter the mind without producing in some degree; at least, the exceptions to such an effect are rare. While there are many whose talents and acquirements may be placed on a level with those of Voltaire, there are few, it is to be hoped, by whom they are used for such vile purposes as were those of that bad old man. The inhabitants of large towns are strongly tempted to spend their leisure hours in frivolous amusement or noisy revelry. Fatigued with the labours of the counting-house or the workshop, they too often seek for relief in such pursuits; but could they be induced to have recourse to the stores of science, how great an advantage would be gained! For an account of its pleasures, I would refer them to the preliminary Treatise of the Library of Useful Knowledge; and strange indeed must be the constitution of that mind which cannot find something to its taste there. In acquiring knowledge, man gains power both over matter and mind. It makes the elements minister to his use, as was forcibly pointed out by your President, in his late admirable lecture; and in addition to the instances adduced by him, I might tell you that it made a few pounds of water tear up by the roots the largest trees, and exert a pressure limited only by the strength of the materials of which the engine (Bramah's press) is constructed; and which was also the invention of a manufacturer. This has been done by the application of the principle that fluids exert an equal pressure in all directions, owing to the mobility of their particles.

But knowledge endows man with power of another kind. It tends to moderate his passions, and aids his intellectual faculties in asserting that superiority over his animal propensities which his Creator intended they should maintain.

Nor is science limited to the explanation of the laws of Nature, but embraces also, in subordination, as I have said, to Religion,

those which should regulate society. By this branch the lower orders are taught the absolute necessity for the existence of different classes of society; and the duty incumbent on those who are not possessed of the accumulated fruits of industry, to provide for their own wants, alike present and prospective, by the labour of their own hands. Hence they are induced to attach themselves to Provident Institutions, calculated on sound principles, with a view of providing against the necessities of sickness and old age. The beneficial effects produced upon their character by the independence thus engendered are truly astonishing. They learn to respect themselves, and feel that they have a strong interest in the preservation of social order. No longer,—if I may borrow, without irreverence, the language of Holy Writ—no longer, "tossed to and fro by the sleight of men, and cunning craftiness whereby they lie in wait to deceive," they do not run after changes in the vain hope of bettering their condition, but advocate such only as their judgment has shown to be rendered necessary by the course of events, and such as they are prepared to recommend by solid argument rather than by physical force. "Every hour," says Dr. Chalmers, "that a workman can reclaim from the mere drudgery of bone and muscle, will send him back to his workshop and his home, a more erect and high-minded individual."

It cannot be denied that the acquisition of scientific knowledge by mechanics has, in some instances, tended to unsettle their minds, and make them feel above their work; and on this account some have thought it impolitic to place it within their reach. The soundness of such an inference may, however, be doubted. As long as knowledge shall be imperfectly diffused, so long will those who have profited by it be raised above those who have not, and will think that the latter alone should be employed in the drudgeries of life; but when it shall have become more uniformly diffused, the difference betwen individuals will be less, and although there must always be inequalities, the pride in one will be held in check by the increased numbers of competitors with himself. Be this as it may, "the question is no longer," as it has been justly observed by Lord Brougham, "whether or not the people shall be instructed—for that has been determined long ago, and the decision is irreversible—but whether they shall be well or ill taught—half-taught, or as thoroughly as their circumstances permit, and their wants require. Let no one be afraid of the bulk of the community becoming too accomplished for their superiors. Well educated, and even well versed in the most elevated sciences, they surely may become; and the worst

consequences that can follow to their superiors will be, that to deserve being called their *betters*, they too must devote themselves to the pursuit of solid and refined learning." Such an effect would prove an advantage of no mean order. When the upper classes are pushed on to higher mental cultivation by the elevation of those below them, they must be said to gather the fruits of their own sowing; so true is it that we can hardly benefit others without benefiting ourselves. Those of them who shall take upon themselves the office of instructors will derive an additional advantage; for the knowledge acquired in preparing ourselves for the instruction of others is most precious; because, in looking for the most simple and satisfactory explanation of difficulties, we must ourselves entirely overcome them, and view the subject in all its different bearings.

II. *The duty of diffusing scientific knowledge* is one which we owe to our *Maker* and to *society*.—If we are grateful to our Maker for all the blessings he has bestowed upon us, is it not our duty to exalt Him among our fellow-creatures, and to make known His attributes of wisdom and goodness; which, while they are pourtrayed in the pages of Revelation, are similarly developed in every work of Nature? "The heavens declare the glory of God, and the firmament showeth His handy work. Day unto day uttereth speech, and night unto night showeth knowledge. There is no speech or language where their voice is not heard." We have all heard that voice; it has reached us in the still, calm hour of night, when we have gazed on the countless host of heavenly bodies, and our thoughts have been called upward to Him who hath set his glory above the heavens; but how has that voice deepened, how thrilling have been its tones when we have contemplated those bodies through the glass of Science, and have learnt somewhat of their number and extent, of the almost immeasurable distance from each other at which some of them are placed, and of the wonderful manner in which they revolve, and retain their relative positions by the forces that the Creator has impressed upon them. Our faculties are unable to fathom the whole depth of the power and wisdom of God which these views partially display; and as to his goodness and providential care of His creatures, there is not a common operation of Nature in which they cannot be demonstrated by the explanation of its causes afforded by Science. Thus, in winter we observe the surface of the water becoming frozen, and after a certain time resuming its usual form. We are taught by Science that in this process there is an exception to a general rule, that bodies contract by the loss of heat; for, at about eight degrees above the freezing point, the water at the sur-

face, in preparing itself for crystallisation, expands, and becomes lighter than that which is below it; in consequence of which it remains at the surface, and being a bad conductor of heat, it preserves the deep water in large rivers, lakes, and seas from being frozen. From the same source we learn that the suddenness of the transition from heat to cold, and the converse, which might be expected to take place during sudden frosts and thaws, and which would prove greatly injurious to our health, is moderated by the latent heat of fluidity being given out by the water as it crystallizes into ice, and being re-absorbed when it returns to a state of liquefaction. In the Polar regions, where it is necessary to the existence of the animals who inhabit them that their internal heat should be kept as much as possible from radiating to the surrounding cold substances, we find them provided with skins of such colours and materials as are most opposed to the passage of caloric; and the breasts of aquatic birds, which in swimming are constantly exposed to the action of fresh particles of cold water, are defended by thick down, which, owing to the extreme fineness of its feathers, proves almost a perfect non-conducting substance, and thus opposes a strong barrier to the abstraction of heat from the body. It is thus that Science, in unravelling the mysteries of Nature, unfolds to our view the wisdom, power, and goodness of the Almighty Creator. The harmony of nature is not the least extraordinary part of this view. The different phenomena seem to arise one out of the other, and to keep each other in equilibrio. The grand miracle is the formation of Nature; the framing of that universal machine which regulates itself according to certain fixed laws that have been appointed for it. A watch of ordinary construction is a surprising and beautiful piece of mechanism, but with every great change of temperature it requires the regulating fingers of its owner. But there are others in the construction of which the principle of the unequal expansion of different metals by heat has been so introduced, that they regulate themselves, and will record the time in the course of a whole year to within half a second. Now, supposing by means of such a chronometer, we had, under very perilous circumstances at sea, been enabled to calculate our distance from land, and steer our course with such nicety as to escape an almost inevitable danger, should we not be constantly talking of this instrument, exhibiting and explaining its construction to our friends, and referring to its maker as being, under Providence, the protector of our lives? Just so, with the same zeal, I mean, and in the same spirit, are we bound to unlock the book of Nature with the key of Science, and to circulate its truths far and

wide amongst those for whose benefit it has been written, not less than for our own.

It is a duty we owe to *society*. We are not isolated beings, but are dependent upon each other for every comfort in life. Hence there are certain duties which we owe to one another. That before us may be deduced from the advantages which we have seen to arise from its proper performance. If from the diffusion of scientific knowledge flows an increase of those things which contribute to the comfort and happiness of all—if the social feelings be improved, and civilization be raised to a higher point than that at which it had previously stood—then it is our duty to extend these advantages by every means within our power.

Society includes ourselves. The evils which result from ignorance are not confined to those persons with whom they originate, but radiate on all sides. Like some pestilential diseases which are engendered, or at least, are rendered malignant by a want of cleanliness, they may eventually scourge all classes of society. The Bohemian peasants rose up and murdered some of their nobles at the time the cholera appeared amongst them, under the belief that they had poisoned the springs of water. What a contrast to the conduct of the inhabitants of this town and of Edinburgh! who *all* united to employ the most rational means of prevention; and so successful were their efforts, that in this place the disease never obtained a footing; and in Edinburgh, although it broke out several times, it never spread to any great extent. It is a duty, then, we owe to *ourselves* to check the evils arising from ignorance, and to promote the blessings which flow from its removal, but diffusing widely the light of Science.

III. It now only remains for me to touch upon the *means of diffusing scientific knowledge*, which may be divided into *early education*, and the *instruction of adults*. Education cannot be commenced too early, if it be conducted upon proper principles. To control the passions, and cultivate the best feelings of the heart,—greatly to exercise the memory, and at the same time to refrain from *forcing* the reasoning faculties of the infant,—should be the care of those who undertake their instruction. A warm heart and a sound head are alike required, with perfect command of temper, and unflinching firmness of purpose. Parents who can engage the affections, and whilst they excite a curiosity after knowledge, can gratify it in a pleasing manner, are the most natural instructors of childhood. When, however, they are either incompetent to the task, or are engaged in manual labour, infant schools are of great value, providing

the greatest care and consideration be bestowed upon the choice of those who are to conduct them. Early education forms the foundation necessary for raising a superstructure of scientific knowledge. By it the use of the necessary tools, reading and writing, is acquired, the memory is exercised, and the expansion of the intellectual faculties is carefully watched and gently aided. But something beyond this may be effected. There are many things connected with natural history which may be advantageously pointed out and explained to children; such as the adaptation of the forms of animals to their habits and wants, as exemplified in the webbed feet of aquatic birds, and the long beaks of woodcocks and similar birds, which enable them to penetrate marshy ground in search of their food; and the teeth and feet of animals of prey, as compared with those which are herbivorous. In a thousand ways of this kind the infant mind may be imbued with a taste for scientific pursuits. But the science of religion is that which it more especially behoves us to bring before children. We cannot make them understand its mysteries or doctrines, but we may exercise them in its discipline, and may make them acquainted with the touching histories of that sublime and vivifying Revelation which may in after years prove a "light to their feet and a lantern to their paths." *Thus* to instruct youth is a task of hope and joyful anticipation. As we witness the blending of religious impressions with the sunny dreams of childhood, we feel assured that when those dreams are recalled in after life, by the power of association, these impressions shall accompany them. They may either grow with the strength of our child into fixed and governing principles of action, or having been smothered for a while by impressions of an opposite nature, they may yet again burst forth, and bring peace to his mind. To the parent who, with mildness and gentleness, has endeavoured to associate religious thoughts with the expanding feelings of youth, how consolatory must be the hope that they will, sooner or later, produce their effects, and ensure him a union with his child in that place where sin and sorrow shall for ever cease. From these considerations it follows that early education is a subject of the deepest importance, and that it forms a material part of that system which is calculated to improve the condition and raise the character of the inhabitants of large towns. The attention of the legislature seems at length turned to the subject, and I cannot but hail with delight that clause in the bill which has been introduced by Lord Brougham, whereby provision is made for the instruction of the young in the whole unmutilated volume of Divine Revelation. It is to be hoped, however, that whatever may be the

efforts of the legislature, those of individuals or public bodies will not relax; but that each man in his family, and each sect in their congregation, will strain every nerve to raise the standard of religious affection and moral intelligence in the rising generation.

The *instruction of adults* may be forwarded by *cheap works, class teaching,* and *public lectures.* The publication of cheap works has increased in this country, of late years, in an extraordinary manner; and while the price has been reduced the quality of the matter they contain has been much improved. The Saturday's and Penny Magazines, the Mechanic's Register, and the Numbers published by the Society for the Diffusion of Useful Knowledge, all contain much information at a small price. At the same time, the works of Franklin, and other instructive books of the same kind, have in a great measure replaced penny romances and those low works of fiction which are calculated only to vitiate the taste, and to interfere with the proper culture of the mind. Above all, the pure Word of God, while it has been translated into almost every known tongue, and has been sent into every quarter of the globe, has been circulated to an extent unknown before, among persons of every class in this country. It may be hoped that each succeeding year and day will witness the fruits of such extensively scattered seed. But what has been accomplished in this manner bears yet a small proportion to that which is required; because this circulation of knowledge serves not merely to supply the demand for it which already exists, but to create others in an almost geometric ratio; so that the more we do, the greater is the necessity for fresh exertions.

Class-teaching possesses one great advantage over reading—the teacher is always at hand to explain difficulties which might otherwise prove insurmountable. By this means the reading and study of the members of the class are directed into a right channel, and thus much economy of time and industry is effected. In this town, a valuable society, formed among the mechanics themselves, has existed almost ten years, under the name of the Mechanics' Institute, and one of its leading features is the class-teaching which is attached to it. Four nights in the week are their meetings held, and instruction is given in mathematics and arithmetic, languages, drawing, &c. Our curator, in his lecture on meteors, detailed to you the result of the observations made by three young mechanics who formed a part of the mathematical class. Their report was highly creditable to themselves and to the Institution with which they are connected. It looks well, indeed, when the working classes are found associating themselves together for the purpose of mental

improvement, and I trust that they will receive continued and increasing support from their richer neighbours in so laudable an undertaking. Perhaps the best way in which money can be bestowed is in assisting the efforts of those who are striving hard for themselves.

The direct manner in which *public lectures* contribute to the diffusion of scientific knowledge is obvious. The facts and experiments from which the laws of science are deduced, being palpably exposed to the senses, bring with them a conviction which no reading could do; and being associated with time and place, they become strongly engraved upon the memory. For the purpose of insuring a uniform and steady supply of lectures in large towns, union is found not only to be advantageous, but necessary. Hence, societies are established, and in this town two such now exist—the Mechanics' Institute, to which I have before alluded, and the Philosophical Institution, the members of which are assembled here this evening.

The necessary appendages to such societies consist in apparatus for making experiments and demonstrating facts connected with all the branches of natural philosophy, and a museum containing specimens necessary for the illustration of the Natural History of the earth, embracing the mineral, vegetable, and animal kingdoms; a good library of scientific works, constantly receiving additions, is also required, to serve as a reference to the lecturers and to the members of the institution. To trace the progress of the Birmingham Philosophical Institution, and to examine how far it has been enabled to accomplish its objects, cannot be out of place on this occasion, when those objects form the subject of the lecture.

It was established in 1800. The gentleman to whom it owes, if not its existence, at least its early prosperity, is Mr. George Barker, who is well known to most of us. To have mainly contributed to the establishment of a society of this kind, at a time when strong prejudices existed against the diffusion of scientific knowledge, is a proof of an enlightened and vigorous mind, and great energy of character, and should entitle him to the lasting gratitude of the inhabitants of this place. In the course of time, the interests of the Institution were advocated and advanced by many, amongst whom I may, without disparagement to others, mention the names of your president, Mr. John Corrie; your treasurer, Mr. Russell; and the late Dr. De Lys and Mr. George Parsons. To the labours of Mr. Parsons, as its secretary, the society owes much; never were perseverance, industry, benevolence of heart, soundness of judgment, and

intellectual cultivation, more united in one individual than in him; and it will be long, indeed, before his loss will cease to be felt by us.

The operations of the Institution were conducted on a limited scale at its commencement. A small room in an obscure part of the town, served for the assemblage of its members and the delivery of lectures. By degrees, however, it has assumed a more imposing aspect; and we now find ourselves in a comfortable little theatre, and in possession of some good apparatus for experimental Philosophy, and of a collection of geological specimens, which has already swelled beyond the limits of the only room which can be devoted to its reception.

Since its establishment, lectures have been delivered to its members by Drs. Dalton and Thompson, and Mr. Richard Phillips, on Chemistry; by Sir James E. Smith, on Botany; by Messrs. Webster and John Phillips, on Geology; by Mr. Campbell, on Poetry; by Mr. Taylor, on Music; by Mr. Scoresby, on Magnetism; by Mr. Addams, on various subjects; and by many other public lecturers. Lectures have also constantly been delivered by the Fellows of the Society, amongst which I may mention those by Mr. John Corrie, Dr. De Lys, and Mr. Baddams. Those of your president are said to have possessed the rare merit of simplicity, even when their subjects were such as are generally considered abstruse, evincing the results of a brilliant imagination and a powerful mind, and conveying both pleasure and instruction to his audience.

There are two circumstances connected with the lectures delivered before this Institution which demand especial notice. I am informed that the Society of Arts arose out of a very clever and beautiful lecture on Design, written by Mr. Richard Lawrence, a Veterinary Surgeon, and read before the members of this Institution by Dr. Bright. But this is not all. Twenty-five years ago, the spot on which I now stand was occupied by one in whom strong powers of mind and acuteness of perception were joined to great benevolence of heart. He pointed out in forcible language the forlorn and hopeless condition of those unfortunate persons who, "although endowed with the same powers, feelings, and privileges as ourselves," had been deprived of the faculty of hearing, and consequently of speech, and "were thus excluded from their natural share in human rights, and degraded in some sort from their rank as human beings." He showed how they might be rescued from this forlorn condition, so "that the same sources of knowledge, and the same books from which we receive instruction, might be open to them, whether for the exercise of their mental powers, for inculcating the

precepts of morality, or for unfolding the truths and hopes of religion." The Lecturer was Dr. De Lys. Beside him stood a little girl, deaf and dumb from her birth, to whose instruction his friend, Mr. Alexander Blair, and himself, had given considerable attention. I find it recorded that "the audience at the lecture were much interested by this little child. Her appearance, indeed, was remarkably engaging. Her countenance was full of intelligence, and all her actions and attitudes in the highest degree animated and expressive; while the eagerness with which she watched the countenances of her instructors, and the delight with which she sprang forward to execute, or rather to anticipate their wishes, afforded a most affecting spectacle."

Strange would it have been had the audience not been deeply interested! For what could have been more calculated to call forth all the warmest feelings of the heart and the strongest sympathies of our nature? The matter did not rest here; the enthusiasm of the town and neighbourhood was lighted up; and there now stands an Institution for the Instruction of the Deaf and Dumb, a lasting monument of the utility of the Birmingham Philosophical Institution. I take my stand here, and contend that if no other instance of its utility could be adduced, this one alone were sufficient to entitle it to the cordial support of every well-wisher to mankind. I do not mean to say that the spectacle would have been less interesting in any other room than in this, or that the arguments would have been less sound and convincing if they had been brought forward elsewhere; but it is more than probable that the attention of these benevolent and talented gentlemen had been directed to the subject by their scientific researches connected with this Institution. At any rate, it was made the medium of communication with the public, and out of a lecture delivered to its members arose the valuable Institution to which I have alluded.

The Birmingham Philosophical Institution has also given a spur to the *promotion* of scientific knowledge. The statistical tables of mortality and of steam-power, and the meteorological journal, contained in the Report for 1836, are highly valuable documents. The latter was kept by means of the self-registering anemometer and rain-guage. This instrument, which excited so much attention at the last meeting of the British Association for the Advancement of Science, (as being something which had long been wanted, but never till then supplied), was invented by Mr. Follett Osler, in consequence of his having learnt the want of such an instrument at a meeting of the members of this Institution. It has been fixed on

these premises, and you will be pleased to hear that the British Association has voted a sum of money for the erection of a similar one at Plymouth, and that the French Institute have sent for plans and drawings of it, for the purpose of testing its utility at Paris. It is indeed a beautiful instrument, combining time with meteorological observations, and causing the wind and rain to record their own operations.

Now, in reviewing the past history of this Institution, we cannot but see that much has been done for the diffusion of scientific knowledge, and something for its promotion; and to those who, after having watched over its interests and forwarded its objects during a long course of years, are now arrived at the autumn of their days, the recollection of the past must be highly gratifying. But we, who are in the spring or summer of life must not confine our view to the past: we must compare the present state of our society with the wants of the town, and examine whether it yet contains all the necessary means for the furtherance of its objects. In short, we must take up the work which our elders have so well begun, and carry out their designs more and more. In doing this, our first attention must be directed to its management; for if that be defective or conducted upon wrong principles, the actions which flow from it must partake of its taint. The Managing Committee is elected every year by the subscribers, from their own body; so that the society can refuse to re-nominate any member of the Committee in whose judgment or conduct they may no longer have confidence. I have been sufficiently long upon this committee to enable me to speak decidedly as to the intentions of its members and the spirit which pervades their councils. Actuated by no narrow or sectarian views in politics or religion, their sole aim is to carry out fully and without reserve, the great objects of the Institution—the diffusion and promotion of scientific knowledge. Had I detected the least trace of an opposite spirit, I should have immediately withdrawn myself from them, as I will never consent to be mixed up with the extremes of any party. But I know that their motives are good; and they court the fullest and most searching inquiry into their actions.

Our attention must be next turned to the state of the building, museums, apparatus, &c., &c. The building in which we are now assembled is found to be perfectly inadequate to the wants of the Institution. Many of the geological specimens, which are every day pouring in upon us, are still unpacked, as there is no room for their reception. There is no museum of zoology or comparative

anatomy; there are no instruments for studying the phenomena of the heavens; and the apparatus for experimental philosophy, though very good in some departments, is in others equally defective. Library there is none; for we can hardly take any account of those few old books which are at present on the shelves of the Museum. It is evident, therefore, that the Birmingham Philosophical Institution must receive much more extended and liberal support before it can effectually attain its objects. This is not a pleasing picture, but it is a true one; and it will be contemplated with pain by the members of the British Association, who will form their estimate of the intellectual character of the inhabitants of this town by the degree of encouragement which is given to its scientific institutions. In the Lecture to which I have referred at some length, Dr. De Lys exhibited the nature and extent of one source of human misery, and at the same time demonstrated the possibility of providing an efficacious remedy. The result was, that a remedy was provided for this town and neighbourhood.

In all that has been brought forward this evening, the alarming nature and extent of the evils resulting from ignorance may be clearly traced; and the advantages arising from their removal, by the diffusion of scientific knowledge, will, I should hope, have been fully recognised. It has been shown that the Birmingham Philosophical Institution was established for the furtherance of this object; that up to the present time it has effected much, and in future it might be expected to do still more, were it liberally supported. Shall its means of utility, then, be enlarged? and shall it henceforward receive encouragement and support worthy of this great town? When I compare the feeble efforts of him who now addresses you with those which must have been exerted on the memorable occasion to which I have alluded, I will own that I despair; but when I look to the *cause* for which I plead, I entertain a hope, or rather a strong confidence, that I, also, on this occasion, shall not speak in vain. My hope is to see arise a substantial and spacious building, containing a theatre capable of accommodating an increased number of members, and apartments that shall not merely serve for the accommodation of our Curator, and for the reception of the apparatus and specimens which are at present in the Museum, but of those also which the liberality of the friends of science, or the increased funds of the Institution, may provide. It has often been remarked that the societies for the encouragement of literature and science in this town are too much scattered; and it has been suggested that an union of some of them, for the purpose of erecting a building which

should contain separate accommodation for each society, would be highly desirable. Another handsome edifice might then be added to those already adorning our town, and increased facilities afforded for the furtherance of the objects which these societies have in view. I do not, however, consider myself capable of giving an opinion as to the practicability or working of such a plan.

To those who are already members of our Institution it would be quite superfluous to address a word in the shape of an appeal for greater exertions in its behalf. Of the necessity for these, at this particular time, they are well aware. There are, however, others here this evening who are not enrolled in our list of members, but who, by their presence, evince an interest in the subject. To such, and through them to the inhabitants of the town at large, I may be allowed to address a few words. To those among them who have become possessed of wealth, either by inheritance or by personal industry, I would suggest that a connection with scientific institutions is one from which they cannot but derive pleasure, and may derive improvement. It is a pleasure, as well as a duty, to employ that wealth which the bounty of Providence has bestowed in so noble a work as the diffusion of scientific knowledge; and if their attention shall be turned, by having engaged in its diffusion, to the acquirement of that knowledge for themselves, their gain will be great indeed. They will also find it to their interest. The surest protection to property will be found in the removal of ignorance and the extension of mental improvement among the labouring classes. Taught to reflect, and to trace the connection between cause and effect, they will soon learn to protect the property of others, and to create it for themselves by honest industry and thrifty management. The legislature has done much towards raising a barrier against imprudence and dishonesty, and thus stemming the tide that would soon have swept into the vortex of idleness and profligacy the property of the honest and industrious: but the completion of the cure must be effected by the improvement of the moral feelings of the working classes, and by their increased mental cultivation.

By these means our glorious constitution will be safely and soundly renovated, and its pillars and bulwarks will be so strengthened that the Gothic pile shall be supported in all the freshness of its youthful days, and shall be effectually defended against the assaults of its bitterest foes. For, as there can be no greater evil in a state, than an increasing estrangement between the different classes of society in feelings and thought, so there is no surer test of its

soundness and stability than a gradual approximation between them in these respects. If successive governments have hitherto neglected to extend efficient support and encouragement to Science, there is the greater necessity for the redoubled exertions of individuals, in order that their deficiency may be counterbalanced, and that they may be shamed into the adoption of a more enlightened policy.

On the manufacturer, the Philosophical Institution has a strong claim for support. He owes every thing to Science. There is not a piece of machinery he makes use of, or a process he employs, which has not resulted from scientific investigation, whether conducted by persons devoted to abstract Philosophy, as instanced in the invention of the safety lamp, by Sir Humphrey Davy; or, (which is still more to the point,) by mechanics who have acquired for themselves some knowledge of its truths, as was done by Arkwright during the time he was perfecting his cotton-spinning machinery. If no other persons would come forward and place this Institution on a footing worthy of this large and populous town, the class of manufacturers might be expected to do so. They will receive an abundant return for all their capital embarked in the diffusion of knowledge; for it will be the means of removing the ignorance which has led to those combinations of workmen, and that destruction of machinery, which have proved so ruinous to all parties.

I appeal, however, to higher motives than these. If you value the approbation of conscience, you will not neglect so great a duty. If you are animated by love to your Maker and to your fellow-creatures, you will use your utmost exertions to diffuse widely that light which brings more clearly into view Him from whom it emanates, and which cannot fail to improve those on whom it shines. In a word, if you would live to the glory of God, and to the benefit of man, you will labour by such means as I have pointed out, by laying early the foundations of knowledge in religious instruction, and by building thereon the beautiful edifice of "Science, truly so called," to elevate, intellectually and morally, the multitudes that are around you, in this town and neighbourhood.

COURAME'; OR THE LOVE OF NATIVE COUNTRY.

TRANSLATED FROM THE FRENCH, BY A LADY.

THE following simple narrative is founded upon an interesting fact, which goes far to prove how deeply patriotism is engraven in the human heart.

A young Indian girl, of the tribe of the Noragues, when about nine years old, had strayed into the forests of Guiana, where she was found by some hunters, and taken to the residence of Madame de St. Croix, the widow of a rich Cayenne planter, by whom she was nurtured. In the land of her fathers this child was called Couramé, which signifies in the Galibis language, "the beautiful." It is the custom of many savage nations to give names to their children expressive of some agreeable attribute, or of something which strikes their fancy, in the smiling scenes of outward nature, which they feel and understand so well. This custom has been handed down, amongst them, from the remotest ages. In the house of Madame de St. Croix, Couramé was baptized by the name of Demetrié, the most tender cares were lavished on her by her adoptive mother, and no pains were spared in perfecting her education. As she grew up in beauty, the gifts of nature were still further displayed by the embellishments and elegance of dress. Amongst her accomplishments she was taught music and dancing, which latter amusement is too frequently made a complicated art, rather than cultivated as a simple means of expressing, by the movements of the body, the light and joyous feelings of the heart.

Couramé wanted for nothing, she knew not a privation, but by a singular want of judgment in those with whom she associated, constant reference was made, in her presence, to the wilds where she had been found, to the miseries attendant upon the condition of savages, and to the happy fate which awaited her in the world, through the goodness of her benefactress. They thought by such conversation the more to endear her new situation to her, but it produced a contrary effect; so true is it that intuitive propensities are in some degree strengthened by contradiction. There appears to be an innate principle which determines the nature of the desires and characteristic inclinations of every living being. The bird which is produced from an egg, though hatched by a strange mother, does not the less obey its

inward impulses, or the instinctive promptings with which nature has gifted it.

Notwithstanding the favours with which she was loaded, Couramé was always pensive and melancholy. The same sadness might be remarked in her, which appears to be so sensibly felt by all beings removed from the clime of their birth. She languished like the flower which droops, withers, and decays, when planted in an ungenial soil. Her inclinations resisted all those tastes which were studied to be imparted to her. She sighed for her native land. A secret inspiration told her that she was formed for a different existence; and a sort of *sauvagerie* shone out from beneath the elegant manner she had acquired by civilization. There was in her looks something vague and absent, which seemed to isolate her in the midst of those who surrounded her. Couramé anxiously questioned all who had been to the Approuague river; she had been told the country which gave her birth was to the east of Cayenne, her eyes were, therefore, ever meditatively turning towards the rising sun; indeed, in her daily walks, she could not gaze on the calm sea without feeling a longing desire to return to the place of her infancy.

Couramé felt no delight in associating with girls of her own age; for the children who shared in her recreations were not of her tribe. She wept because she had neither brother or sister. She regretted the pastimes of her country. In the midst of abundance and riches, every thing was wanting, for her mother was not there.

She was nine years old when taken from the forest of Guiana, and at that age whatever is impressed on the mind is not readily obliterated. She was always pensive and abstracted. During the night she would often give way to sobs and tears, and when at length sleep came to her relief, the voice of her mother would disturb her dreams. Notwithstanding all the grief she endured she was still beautiful, though languor was visible in every feature of her countenance, and that touching melancholy which, as an ancient writer has said, is in some degree an ornament of grief. With Madame de St. Croix, Couramé was constantly the object of solicitude. She had all the advantages of instruction, from the best masters, which money could procure. Couramé listened to her preceptors with attention; they spoke of her progress in accomplishments as a prodigy. She was taught the French language; but by her there was one language which was preferred to every other, that was the Galibis—so poor in superfluous words, but so rich in affectionate and tender expressions. Every word of this savage dialect, which had never been used to dis-

guise the thoughts, and which her mother had taught her from infancy, was cherished.

It is remarkable that Couramé's education, far from extinguishing in her the love of her country, had only strengthened this affection, by developing all the energies of her mind. At this particular time there was a project on foot for civilizing the savages of Guiana, and the French government was made acquainted with it. Now Couramé read with extreme avidity every thing which was published relative to the wandering nation of the Galibis, the industry of the Noragues, their habits, pastimes and other characteristics. Her imagination was stimulated by numberless recitals tending to foster her darling wish, which was to end her days amidst the scenes that had cradled her. "Cherished country! country where I first saw the day!" cried she, "who can restore me thy charms, or what can excite the happiness thou bestowest on me? Who can think of thee without regretting thee, without longing to behold thee again?" Madame de St. Croix had long perceived that Couramé was not happy, she courted solitude, and though in the midst of so many who loved her, she seemed like a creature of another species. None knew whence to attribute this melancholy; on her own part Couramé dared not tell the cause of her grief. She feared to be thought ungrateful, and to afflict her benefactress. Madame de St. Croix imagined sometimes that an irresistible sentiment of love perhaps had taken possession of her heart, for she was then fifteen years old; and when the mind is occupied by one thought, that thought monopolizes every other. Besides, she saw that the praises lavished on her beauty fell insensibly on her ear. She endeavoured to console her by affectionate endearments. Vain attempt! of what value are the caresses of an adoptive mother, when we embrace, in imagination, her who has born us in her bosom, who has nourished us from her body!

The only thing which lessened Couramé's regrets was reading some historical works which Madame de St. Croix had kindly given her; for her benefactress was possessed of a highly cultivated taste, and looked upon books as friendly consolers which prevented the mind from dwelling too intently upon sad impressions. Couramé profited by this resource, as well as by the conversation of Dr. Valayer, a worthy old man, who for more than forty years had been the idol of the colony. He was as amiable as enlightened; was the physician of the soul, as well as of the body. He had penetrated the secret thoughts of Couramé; but he carefully concealed from her his knowledge. He had ever a gentle and delicate manner in his

conversations with his patients which quickly won upon their confidence.

Ere long a particular event brought a happy change in Couramé's existence. M. Le Baron de Besner, a most enlightened philanthropist, was at that time governor of Cayenne. He carried the most active mind in a weak, imbecile body. He was always influenced by the most anxious desire of being useful to mankind, and his ardour was indefatigable; above all he loved the Indians, and wished to ameliorate their condition by civilizing them. The better to further his designs, the Baron endeavoured to draw some Indians of Guiana by various pretexts to Cayenne. He wished to induce them to appreciate all the advantages enjoyed in towns; and for this purpose it was necessary to allure them thither. His aim was to make these savages approach the civilized inhabitants, to make friends of the colonists, and to turn them insensibly to those habits which could ennoble them in their own eyes. He flattered himself that he could influence particularly the manners of the Noragues; who of all the savages are those who shew the most morality; who respect their parents; who have the most justice and good faith. In a journey which he had made to the territory of the Approuague, he had gone amongst them, and he was persuaded that he might do much with this interesting tribe. He hoped to make them labourers under whose hands the fertile country they inhabited, would prosper. He could communicate with them so much the better as the greater part were baptized and had already received some of the benefits of civilization. M. De Besner informed their chief, Almiki, that it would perhaps interest him to come some day into the metropolis, with some of his followers, to deliberate upon affairs which concerned him, and which related to the prosperity of the tribe. The message was adroitly delivered by an ambassador, who acquired great ascendancy over him.

It is well known how unwillingly the savages carry on communication with strangers, unless constrained by force or by the pressure of their wants. But the Noragues had been for some time very poor: they wanted axes, sabres, muskets, and other implements. They imagined, with reason, that their journey would be profitable to them in this point of view, and they accepted without hesitation the governor's proposal. The aged Almiki, too old to quit his hut, consented to the departure of his son, who was accompanied by several men and women of the tribe. The news was spread in Cayenne that the Noragues were coming: Couramé's joy was not to be described. She imagined that she might now return and see her mother, and the

love of country was renewed in all its force. In her impatience she counted the days and hours which then intervened before the expected arrival of her countrymen. The present time is ever a weight to a mind which only feeds on hope. Couramé ran over, in her memory, all the words of the language she so well knew before her capture. She felt sure of being recognized by her friends, for though she lived in the splendour of riches, and though her clothes were very costly, she always preserved something of the Indian costume, and wore the long smooth tresses of the Galibis women. Her ears were adorned with coral, her neck was enriched by a chain of red seeds, and her bracelets were composed of little sea shells. Madame de St. Croix, who was proud of the elegance of her adopted daughter, liked to perceive in her attire these distinctive characteristics of her nation.

The arrival of the Indians was hailed with universal joy. They marched in file, one following another, after the manner in which they were obliged to traverse their own woods. The whole population of the colony ran out to see them pass. The savage is always an object of curiosity to the civilized man. The young Couramé could not contain her transport on beholding the people of her tribe. In the language of the Galibis, she entreated them to give her news of her mother, she spared no signs or gestures to make herself understood, and sought the answers in their looks. Her imagination beheld in them her parents, her home, all the territory of the Approuague.

Amongst the Indians who came with this deputation to the governor there were several of good stature and noble appearance. The son of Almiki was distinguished above them all by his costume, which was more gracefully arranged than that of his companions. He was armed like a warrior and had a commanding air, though his countenance was thoughtful and melancholy. His features, however, became less austere when he perceived Couramé. But the latter directed her attention to a group of Noragues women, who walked behind, carrying fermented liquors and some flour of manioc, to make a sort of thickened soup for their husbands. The Indian women were clothed more modestly than they were wont to be, and most of them were adorned with feathers: they wore petticoats of blue worsted or calico, which is the favourite colour of the Noragues. Some of them had heightened their complexion by paint. They walked in buskins or shoes ingeniously woven with rushes and cotton threads. Notwithstanding this rather whimsical costume, Couramé was enchanted to see them, and thought that their ornaments were preferable to those with which she was adorned. She envied their

lot, and longed to be with them. As to the Indians, they were delighted with Couramé, whom they had recognized, and stood gazing upon her with the greatest astonishment. It was an interesting sight to see those inhabitants of the forest mingle with the people in the town.

They were brought to the governor, and eagerly asked for muskets, bill-hooks, axes, and other tools or instruments, of which they had great want. The Noragues women displayed their rush baskets and their earthen vases, which they gave to the ladies, receiving in exchange jet necklaces, bracelets, and other articles of ornament. During this time, Couramé mixed with them: she sought for her mother, who, not suspecting that her daughter still existed, had not quitted the huts. The governor received the Indians with the most free cordiality; for, as before stated, his ardent wish was to make them enjoy the sweets of civilization. But no sooner were they arrived than they began to talk of returning home. In order to detain them, the governor endeavoured to interest their curiosity, but nothing could captivate them. The admiration of savages is flighty and evanescent: Amongst them, the passion of self-preservation is the only permanent one. Thus they observed nothing extraordinary in the paintings and master-pieces of art which were shewn them: they always thought the scenes of Nature preferable, and longed to return to them. Every thing that did not relate to their especial wants made no impression upon them. The mirrors which they found in the saloon of the governor did not astonish them, because they had often seen themselves reflected in the Approuague river. No surprise was expressed when pictures were placed before them, for they only fancied they saw the image of an object in the water. At first they were delighted by the wind instruments which composed the band of the regiment, so superior to their own flutes of bamboo, from which only the most monotonous sounds could be drawn. The Indians like tumultuous and loud noises, which do not express anything fixed or determined.

M. Le Baron de Besner neglected nothing which could prevent the deputation experiencing ennui or constraint. To amuse them, he gave a grand feast; and what astonished them most was to see the number of dishes which appeared successively. They could not imagine the use of so many of the superfluities which were already introduced in the houses of the rich Europeans. After the repast, various games were introduced for their entertainment, when Couramé appeared before them and executed a Norague dance in an enchanting manner, embellished by all the improvements of art. The Indian surrounded her and seemed to follow every step by observing th

cadence with a remarkable precision, and they were in extacy with the inimitable grace of her movements. Couramé joined to the polish that education had given her, that native grace and elegance which she inherited from the country that gave her birth.

The Indians afterwards acted several pantomimes, a species of amusement much in use amongst the Galibis. At the conclusion of the fete, the Indians sang after the manner of their country, which much gratified the curiosity of the colonists. The music of the Noragues is sad and melancholy, like that of all the Galibis; but its notes are very expressive when they paint the anguish of grief and distress. A young Indian girl sang, in a soft mournful strain, a hymn, which expressed the regrets of a mother whose child had been overwhelmed by the rising of the tide, at the mouth of the Approuague, a calamity of not uncommon occurrence. But Couramé could not hear such regrets without shedding a torrent of tears. She imagined that her own mother wept for her, and this idea plunged her into a sadness which prevented her from taking any part in what was passing around her. However the youth, the grace, the attractions of Couramé had made a great impression on the Indians; for who could see her without admiring her? She was beautiful as a Grecian statue.

The joy of the Indians was excessive when they thus accidentally found one of their tribe, who had been separated from them by civilization, and they wished to restore her to their country. Couramé talked to them incessantly in the sweet and persuasive Galibis language, which is comprehensive enough to express the most important things in common life. She gave them to understand, by every means in her power, the ardent desire she had to return to the place of her birth. The feelings of savages are very strong and ardent, however exercised, whether in love or revenge. Scarcely had they seen their young countrywoman ere they entertained a great affection for her. And, meditating flight from Cayenne, she mingled with the Norague women, who surrounded her, and seemed as if they wished to carry her away with them. They understood each other in a moment; signs and looks expressed what words could not, and Couramé listened to all their communications with growing agitation. She was more than ever determined upon the project of quitting the town, and returning to her tribe; and drawing the Indians aside, questioned them closely on its practicability.

Meanwhile the night advanced, the Baron had provided sleeping accommodation in the great hall of the old mansion of the Jesuits, in order that the Indians might repose themselves. During which time

Couramé was watching and secretly preparing for her flight. One thing only made her unhappy, this was the grief that her departure might occasion Madame de St. Croix. The poor girl wavered between two conflicting feelings, for nature has not given us unalloyed pleasure in this life—nothing is more painful to the mind than these opposing inclinations, these inward combats, striving for mastery, when the heart is divided by two powerful interests distressing perplexity is necessarily the result. The moon shone in unclouded splendour, and Couramé profited by the light to contemplate from her window the tranquil ocean. With what joy did her eyes wander over this azure plain, which was soon to be ploughed by the swift Indian canoe. Cayenne is not very far from the territory of Approuague, but it seemed as if she had infinite regions to traverse before she could arrive at the end of her wishes. To an impatient heart it is not space, but longing that constitutes distance. At length the dawn appeared, and Couramé summoned up all her courage to quit the house of her benefactress. But how many mournful feelings arose in her heart! It is possible to return in transport to one's native land, and yet to shed some tears over the hospitable threshold which has heretofore sheltered us. Couramé sobbed convulsively when abandoning the house where she had been so generously received, so warmly beloved. She wrote a letter to her benefactress in which feelings of deep sorrow and glowing gratitude were mingled, and she deposited on the table all the gifts which she had received from the hands of Madame de St. Croix, and left in a box all the jewels which adorned her dress.

Clothed in a simple Indian robe, her long smooth hair was her only ornament. The town was yet wrapped in repose, when she ran with precipitation towards the shore, where the Noragues waited for her. She met few people at this early hour, and the simplicity of her dress prevented her being known. She leapt into the canoe, the hymn of departure was sung, and they rowed in cadence towards the land of Approuague. The Indians took their leave loaded with presents from the governor, the winds were favourable, the voyage speedily at an end, and the canoe which conveyed Couramé arrived safely at its destination.

But no words can express the grief of Madame St. Croix when she heard of the flight of this beloved daughter, whom she had loaded with favours and cherished so tenderly. At first she refused to believe that so lamentable a misfortune could have occurred, but her doubts were soon removed when she entered Couramé's room and saw the

letter which this poor girl had written to her. Madame de St. Croix was inconsolable, nevertheless she did not think of using any means to reclaim her from the Indians, as she held Couramé to have exercised no more than a duty in returning to her real mother.

Five years passed without any tidings of the fugitive; she was perhaps happily settled in her mother's hut, and this idea lessened the regret of Madame de St. Croix.

Couramé was indeed almost forgotten at Cayenne, and her name rarely mentioned in conversation. By the most singular chance, it happened that the good Dr. Valayer was led to the banks of the Approuague. He had an estate in this fertile spot, and went to visit it. He entertained the idea of establishing botanical gardens there, as he was passionately fond of this branch of natural history, and was considered one of the best pupils of Bernard de Jussieu.

It is impossible to depict his surprise, when, on visiting the Norague Indians, the first person who presented herself was Couramé, whom he immediately recognized. He entered into her hut, where he found her surrounded by all her family. Her husband was the son of Almiki, the chief of the tribe, the same who had been one of the deputation to the governor of Cayenne, when Couramé bore the name of Demetrié. It was the same youth whose noble air had been so much admired at the fête given by M. Le Baron to the Indians; and it was well that the flower of the Norague women should be united to the bravest of the men. Couramé still lived with her aged mother, whom she assisted and consoled. Some earthen vessels, some instruments for hunting and fishing, and the rude sleeping couch composed the furniture of the dwelling in which she preferred to pass her days.

Dr. Valayer beheld with astonishment, the changes which had taken place in the deportment of Couramé. She was no longer the young girl devoured by ennui and melancholy, in the midst of luxury and refinement. She was now a woman whose delight consisted in her maternal cares, and who passed her days in domestic peace. But she was still beautiful, and had not lost her taste for ornament. She wore a necklace made of tiger's teeth; her tresses were adorned with precious stones, brought from the sands of the Ruby river; her bracelets were of an Indian grain, which sometimes resembles jet. It may be truly said that a well arranged hut, is the abode of the partriarchal virtues.

Dr. Valayer declared he never saw a more touching picture. He blessed the day on which his own affairs and his love of Botany had

led him to these scenes. He put a multitude of questions to her upon her new situation, and her answers showed that she was more than satisfied at having been restored to her primitive condition. He asked her, what had become of all those talents which had been cultivated with so much care during her residence at Cayenne? He wished to know, above all, what had become of a very valuable library which Madame de St. Croix had given her to perfect her education? "Behold my books!" replied she, pointing to her children and the new-born infant at her breast. "I am a wife and a mother. All my learning has gone to make room for my affections. Of all that you have taught me, I only preserve the fear of God, which has sustained me in all my afflictions. I owe to him the prosperity of my family and the continuance of the happiness which he has bestowed upon me on earth.

Couramé and the Doctor then entered into a conversation, in which they balanced the inconveniences of a social life against those of a savage one. "Talk not to me of your science," said she, "it only creates doubts. What makes the Noragues happy? his bow and his freedom. My children know and love God; but they do not seek to penetrate the secrets of Providence. Their reason is never harrassed; they enjoy happiness here below without enquiring whence it comes. We have prudence, the preserving genius of rational, sensible beings, to guide us through life. That independence which you seek for with so much ardour, we possess; for, in the midst of our woods and in the bosom of beneficent and hospitable Nature, there is neither tyranny nor servitude. We do not value your sentiment of fame, because we do not know it."

During this conversation, the brave Almiki, her husband, who was smoking odoriferous herbs, seemed enchanted with the good sense and wisdom of his wife. Valayer, on his part, admired the choice of Couramé's expressions, which singularly contrasted with her wild condition. He approved her resolutions and was moved by her sentiments, in which he so far acquiesced as to eventually sell those possessions which he had in Cayenne, and return to end his days in the land of his birth.

THOUGHTS ON EDUCATION.

EVERY genuine lover of science must deeply regret that the differences existing among men, with regard to political government and religious discipline, should so frequently interrupt and destroy that general harmony which ought to exist in a civilized community. This contrariety of sentiment too often, by circumscribing the bounds of social intercourse, checks the extension of intellectual improvement and the dissemination of the most valuable knowledge. Thus it is, that party spirit, like a chilling blight, withers the promising bud of science and engenders a canker worm in the fairest blossom of the tree of knowledge. All classes of society, even the most talented individuals of the land, seem occasionally to be subject to the domination of this false and misguiding prejudice. All such discrepancies would be reconciled if human wisdom could attain perfection and become universal. But however powerfully this desirable consummation may have been exhibited in theory, it is utterly impossible to be practically exemplified so long as the passions and infirmities which now sway the human mind remain in full action. And what power of man can exterminate evil from the world; or what golden dream of purity and bliss will not the waking stern reality of misery and degradation dispel?

The thraldom of the dark ages is now passed away; the light of knowledge has dawned upon the world, and continues to shine with increasing splendour; the stream of wisdom has spread far and wide through distant lands, and enriched with its jewelled sand the remotest shores. The amelioration of the moral and physical condition of men, with the consequent improvement of their social and intellectual capabilities has been the result. All great and extensive changes in the mental economy of man, are universally acknowledged to be best effected by slow and gradual means. There is no golden way to wisdom—no enchanter's wand by which the rude and primitive barbarian of some insulated spot could be at once changed into the civilized member of polished society. The light of knowledge makes a much surer progress when it shines with a steady and unchanging lustre, gently pervading the cheerless gloom and dispersing almost imperceptibly the clouds of error, than when it is forced into a vivid but fitful blaze which, for a time perhaps, may shed around the brightest flashes, serving to shew more palpably the darkness of ignorance, but too evanescent to dispel its shades.

In those countries where civilisation has made most rapid strides, where the immense advantages of science are duly appreciated, and where all the various arts are cultivated for the common weal, great differences of opinion exist as to the kind and extent of general education. The good cause which every genuine philanthropist must have at heart—viz., the amelioration of the condition of his fellow creatures, is by these conflicting views materially injured, and the progress of improvement in the needy part of the community mainly retarded. A constant series of speculative controversies, vehement denunciations, and individual systems is created amongst those whose office and duty it is to direct in the path of wisdom those less informed than themselves; and, by a strange perversity and spirit of opposition, these teachers themselves too frequently, on the one hand, become prejudiced bigots for old customs, or, on the other, visionary enthusiasts for new chimeras. Without entering deeply into the respective merits of these questions, it may be well to remark that the nature and quality of the knowledge bestowed ought to be adapted to the extent of mental development exhibited in different states of society, whether those states be but one step removed from the waste of barbarism, or far advanced in the cultivated fields of civilisation. The food, to be nutritious, should be capable of being easily digested. It is a familiar aphorism, but not the less true, that we should give milk to babes. It is the quality, not the quantity, of the knowledge imparted that is liable to objection. The soil should be prepared by degrees for the perfecting of the choicest produce. The whole economy of Nature seems to be in accordance with this progressive system. The tiny spring issuing from the mountain's side gathers strength and volume from every tributary rill received in its course, until it swells into the majestic stream which flows through the plain, enriching the bordering lands with its fertilizing flood. The newly-formed bud, inclosed in its protecting folds, gradually bursts into light and is matured into the perfect fruit by those rays which would, in its earlier state, have withered and destroyed its tender fibres. A sterile tract, recently exposed to the vivifying influence of the sun and atmosphere, at first yields only Thistles or Lichens: these in turn decay and qualify the soil for the reception of choicer produce, till at length the luxuriant blade, the glowing flower, the blooming shrub, the majestic forest tree, and the golden harvest successively adorn the once barren waste. Now, during all these progressive changes, each succeeding development is fed and freshened by the genial dew of Heaven; and this may not inaptly represent those moral and reli-

gious precepts which ought ever to accompany and direct the advance of knowledge.

Many self-constituted philosophers, who have obtained most of their wisdom from books, rather than from an extensive acquaintance with the world or familiarity with the practical details of human nature, and whose sphere of observation is limited to the various hypotheses of metaphysical reasoning and the wild speculations of theoretical conjecture, too frequently prefer espousing new theories and promulgating new systems, rather than endeavouring to apply acknowledged facts, or more widely diffusing perhaps old-fashioned principles.

The happiness of a people does not altogether depend upon their commercial prosperity, or on the extent of their intellectual acquirements as regards acquaintance with the various arts and sciences, but rather on their moral condition. The wisest and best of mankind have, throughout all past ages, universally expressed their entire conviction that a higher motive to moral action is required than that presented by the mere temporal advantages arising to society from such a condition: for the advantages must vary with the changing state of such society: and if once expediency is admitted as the rule of conduct, the standard of right is instantly depreciated and opinion usurps the place of immutable truth. It is, then, only by the aid of the more exalted sentiment of religion that moral precepts can be enforced and maintained. The faculty of veneration disposes man to adore the Creator of the Universe: *first*, as seen in the book of Nature, and *secondly*, as displayed in the volume of Revelation. This faculty is doubtless an innate power of the human mind, implanted there for the wisest purposes; but this, perhaps more than any other of the mental powers, requires direction in its development, in order that its legitimate effects may be produced. When it is in accordance with, and in obedience to, the declared will of the Creator, it cannot be too active. Thus manifested, it controls all the fiercer passions, and bridles every licentious desire; at the same time, it curbs that feeling of false independence and assumed wisdom which is engendered by pride and fostered by self-confidence, and which proves so frequently a stumbling block to improvement and happiness. But the purifying influence of religion does not arise, as in simple moral government, from the probable evil that may accrue to society from the free indulgence of bad propensities; its influence proceeds from an unwillingness on the part of the individual to displease the Being whom he acknowledges alike to fear and to adore. The highest possible

motive to action is thus furnished, and an unerring standard of right and wrong is for ever established. The abuses of the faculty of veneration are manifold, as exemplified in the extravagant mythology of the pagan world, the cruel superstitions of the barbarous ages, and the wild fanaticism of more modern days.

Infidel sophistry would endeavour to obscure and divert the genuine light of truth by refracting it through the medium of human passions and human prejudices, and would persuade men to submit every thing to the test of their own reasoning powers. Thus it would reduce within the limits of a mathematical triangle, the laws and economy which govern the universe; whereas there is much that reason cannot fathom which Revelation declares to be true, and it is only by a calm, careful and unbiassed examination of the declarations contained in the Sacred Writings that the benevolence and wisdom of the Creator's ways can be understood, and their ameliorating influence acknowledged.

It is generally admitted that misery is often the concomitant of ignorance; but it does not follow, as a positive induction, that happiness would be attained by the possession of mere scientific knowledge. If such was the case, superior intellect would ensure a greater share of happiness, while a less fortunate mental endowment would necessarily always experience corresponding misery. Now, this is not practically the fact. The most talented are not always the most free from vice and sorrow. Nor are the less informed always strangers to visions of bliss. It is only by virtue founded on religion, individually practised and generally disseminated, that permanent happiness can be promoted.

Have the writings of Rousseau and Voltaire increased the welfare of mankind? Rather, by encouraging doubts and scepticism, under the fair cloak of morality, have they not loosened the bonds of society, and been direct agents in producing crimes the very calendar of which is fearful to look upon? Have they not, by withdrawing the restraining influence of religion, set at liberty the will of man to revel in all its wild imaginings, and to own no government save that arbitrary and yet vacillating power, the boasted sovereignty of reason? Are the discoveries of a Newton, a Davy, and innumerable other benefactors of their race, less important to the community because they blended religious sentiments and feelings with their philosophic pursuits? It is often argued in these days of ostentatious liberality, that religion has nothing to do with education; that it fetters the judgment, and is a clog to the free extension of knowledge. False,

delusive reasoning! As well might it be said that when the vessel spreads her broad canvass to catch the passing wind, and pursues her way across the tumultuous ocean, that the directing hand of the pilot, as he guides her through the various dangers that encompass her track, unduly fetters and restrains her free course. Let him but once quit the helm and suffer the ship to obey the wild blind impulses of the elements, and she will quickly be swamped by the rushing waves, or stranded on some hidden rock. It is just so with education. Let instruction,—that is, instruction in the spirit and word of the Christian obligation—be once excluded from the preceptor's paramount duty, and the young mind, as its various powers are disclosed, will be borne along through the sea of life a prey to wild passion and conflicting opinions, and will ultimately make shipwreck of all its brightest hopes. For, as the compass possesses no inherent power in itself to guide the bark, or bring it to the wished for haven, but is merely the instrument in the hand of the pilot; so reason, undirected by religion, is inadequate to ensure present happiness or secure from future misery. At the same time, it should be distinctly understood, that all bigotry is diametrically opposed to improvement; for, where the excellence is presupposed to be superlative, there can be no desire for farther enquiry and no acknowledgment of the possibility of erring. But the religion that inculcates charity and humility as its vital doctrines, must necessarily be at variance with all narrow-minded pride and self-sufficiency.

Some persons possessing weak reflective faculties and confined prejudiced notions, who are incapable of taking comprehensive views of a subject, or of foreseeing remote consequences from present causes, frequently express alarm at the rapid progress of improvement, and inveigh but in vain against the increasing wisdom of the age. The stream of knowledge cannot be arrested, and no sound thinker, no general well-wisher to mankind would desire to stay its course. But it is the duty of all to endeavour to direct its currents in those channels which will at once tend to enrich and adorn the intellectual domain. The human mind will inquire, it will endeavour to progress. It must have food to satisfy its increasing appetite.

The wonders daily brought to light by the researches of science, and the speculations induced by the discoveries made relative to the different capabilities of matter, present a constant and ever-varying banquet; but the viands must not be seized indiscriminately, and the greatest care should be enjoined in adapting each to the peculiar condition of the receiver. Where the intellect is highly cultivated, all

may be taken—every flower in the garden of knowledge may be plucked. The solid earth, the yielding waters, the ambient air, the numerous varieties of organic life, the phenomena of the subtile elements, and the stupendous fabric of the celestial system, may all be searched into, and the symmetry of their structure displayed. Even the mystery of life and immortality and of the creative energy may be investigated, so long as there is a fixed principle to control the feeling of overweening pride, and to teach man that his powers are finite and his wisdom but foolishness. This principle is pure Revealed *Religion*.

E. M.

TWO CHAPTERS, ILLUSTRATIVE OF THE CHARACTER AND CONDUCT OF JAMES I.

"It is scarce hyperbolical to say, that this prince has been the original cause of a series of misfortunes to this nation, as deplorable as a lasting infection in our air, our water, or our earth would have been."—BOLINGBROKE'S *Dissertation upon Parties.*

"Maximus in folio, minimus in solio."

"The reading of histories may dispose a man to satire; but the science of history studied in the light of philosophy, as the great drama of an ever unfolding Providence, has a very different effect."—COLERIDGE, *On the Church and State.*

CHAPTER THE SECOND.

If James had rendered himself contemptible at home by degrading the character of royalty abroad, he had become still more so, by not displaying the lofty spirit of a king of England on occasions where he ought to have manifested it—by his sneaking, shabby, huckstering, penny wise and pound foolish policy—when, according to every rule of reason and justice, he should have acted up to the dictates of a large and sound policy. In 1604, by a peace with Philip II., he concluded that war with Spain which Elizabeth's great determination of character had enabled her to prosecute in the most vigorous man-

ner. Now if a diplomatist of the present day were to ask whether this self-sufficient adept of Kingcraft had obtained a *quid pro quo?* the fair and impartial answer would be, he had suffered himself to be so completely over-reached that England had not gained a single advantage, while the Netherlands were piteously consigned to their fate.

Again, upon the negociation which the Netherlands entered into with Spain, respecting the recognition of their independence in the year 1607, it might have been anticipated he would assume an attitude of greatness corresponding to the bravery of the people over whom he reigned. When Elizabeth would have spoken that generous and warlike language which would have succeeded doubtless in attaching the new state to her, by the surest of all ties—confidence in her power as well as in her integrity and ability—nothing of this fell from the lips of James. The people of the Netherlands were odious and wicked in his eyes as a set of rebels; and from his outrageously insulting their feelings at one time by avowing them to be such, and at another by conducting himself in the most contradictory manner—blowing hot and cold with the quickest change, during the midst of the negociation—the result of his fluctuating, irresolute, timid policy was that Henry acquired that paramount influence which Elizabeth would have grasped and maintained.

Now we love peace and we hate war; especially a war of pride, ambition, passion, aggrandisement, and tyranny. We should then have applauded the pacific dispositions of James if he had pursued peace as the means of alleviating the burdens of his people, as opening to them fresh channels of commercial intercourse and commercial enterprize, as promoting arts, sciences, and civilization. But history has recorded on her most durable tablet that this possessor of the English throne would have purchased peace always at the price of ignominy: however inconsistent it might be with public interest or national honour, he would have sought it as a prize justifying the basest arts and compliances, provided it could only have insured him the indulgence of his habitual apathy and indolence. What was his declared motto, "*Beati pacifici*," but a confession or proclamation in *him* that he was of a nature impassible to those insults and offences which would have unsheathed the sword of every other crowned head in Europe?

His relations, then, with the principal continental powers might have soon ceased if family circumstances had not again served to renew them. By a most unaccountable perversity of judgment, he was

desirous to have a Spanish alliance cemented with Spanish blood; in other words, a Spanish princess was to be the wife of his son and successor—a Roman Catholic, therefore, a descendant of a family and nation inveterately and incurably opposed to the religious and political interests of England—seeking this union too in utter disregard of that sagacious determination expressed in his own *Basilicon*, of sedulously avoiding a popish match for his son. And while concession after concession was made to bring about this marriage with one who invoked saints and heard mass, they produced no other result than that of Spain duping and deceiving our Solomon for seven long years.

The marriage of his daughter Elizabeth had created new continental relations, and, with them, events as disastrous as they were shameful to James—events which might have been effectually averted if, here again, he had not behaved like himself; that is to say, with indolence, irritability, fickleness, and incapacity. Nevertheless, upon his foreign policy in this respect, Burnett is accused by Higgons for displaying his overflowing rancour against this unworthy successor of Elizabeth, because he said "It was expected that so near a conjunction might have prevailed on the king; but he had an invincible aversion to war, and was so possessed of the opinion of a divine right in all kings, that he could not bear that even an elective and diminutive king should be called in question by his subjects; so he would never acknowledge his son-in-law king, nor give him any assistance for the support of his new dignity.*"

During the visit which that unfortunate prince, Frederic V, Count Palatine of the Rhine, and afterwards for a short time King of Bohemia, paid to England, for the purpose of seeking in marriage Elizabeth, the lovely† daughter of James, his manners were so popular and gracious, and his character so amiable, that he gained the esteem and respect of the English Court and of the country at large.‡ How strongly the national mind ran in favour of the unfortunate Palatine after his dethronement and the loss of the electorate, is shown in the following remarkable fact:—On its being reported to the Commons that one Floyd, a Roman Catholic, had expressed to his wife the pleasure he felt at hearing of the fallen fortunes of the Palatine, the House became so infuriated as actually to condemn him to be pilloried,

* *History of his own Time*, vol. i, p. 22.

† Her personal attractions are well delineated by Miss Aikin.—See *Memoirs of the Court of King James I*, vol. i, p. 427.

‡ See Winwood, vol. iii, p. 403.

whipped, fined, and imprisoned for life. The Lords, however, conceiving that it would be a surrender of their constitutional rights to allow the lower House the power of adjudicating and committing, so effectually interfered as to succeed in checking this encroachment upon their privileges,* although, to their unspeakable disgrace be it added, they partly acquiesced in the violent and arbitrary resolutions of the Commons. As a still more striking instance to what a depth and intensity of feeling the cause of the Palatine had possessed the judgment and conscience of the Commons, just before their adjournment by the king, says an eye-witness of the enthusiastic scene, "with the voices of them all, withal lifting up their hats in their hands so high as they could hold them, as a visible testimony of their unanimous consent, in such sort that the like had scarce ever been seen in parliament," they in this manner resolved to support the Palatinate with their lives and fortunes.†

Another anecdote manifests the warm sympathy that was felt in behalf of the ill-starred and much admired Elizabeth:—"The lieutenant of the Middle Temple played a game this Christmas time, whereat his majestie was highly displeased. He made choice of some thirty of the civillest and best fashioned gentlemen of the House to sup with him; and, being at supper, took a cup of wine in one hand and held his sword drawn in the other, and so began a health to the distressed Lady Elizabeth, and, having drunk, kissed his sword, and laying his hand upon it, took an oath to live and die in her service; then delivered the cup and sword to the next, and so the health and ceremonie went round."‡ Seldom has royal misery been depicted in more vivid and affecting details than in the following letter of the Ex-Queen to her father:—

SIRE,—I do not wish to importune your majesty with a very long letter. The Baron De Dona will not fail to inform your majesty of the misfortune that has befallen us, and which has compelled us to leave Prague, and to come to this place, where God knows how long we shall be able to remain. I therefore most humbly entreat your majesty to protect the king and myself, by sending us succour; otherwise, we shall be brought to utter ruin. It is your majesty alone, next to Almighty God, from whom we expect assistance. I most humbly thank your majesty for the favourable declaration you have

* *Parliamentary History*, vol. v, p. 418—429.

† See Hallam, *Const. Hist.*, vol. i, p. 302.

‡ See Ellis's *Letters on English History*, vol. iii, p. 118, 119.

been pleased to make respecting the preservation of the Palatinate. I most humbly entreat you to do the same for us here, and to send us sufficient succour to defend ourselves against our enemies; otherwise, I do not know what will become of us. I therefore again entreat your majesty to have compassion on us, and not to abandon the king at this hour, when he is in such great need. As to myself, I am resolved not to leave him, for if he should perish, I will perish also with him; but whatever may happen, never, never, shall I be other than,

Sire,

Your majestys most humble and most obedient daughter and servant,

ELIZABETH*

Breslaw,
23
13 *November,*

To the King.

But this touching appeal to parental affection which might reasonably have been expected to excite a burning impatience on the part of James to redress his daughter's wrongs, produced in him no other feeling than that of extreme dissatisfaction. Now, though no person could have looked for one so destitute of personal courage as this monarch was to play the part of Gustavus Vasa—to stand forth as the defender of the Protestant religion in Germany, or for his pacific policy to dare to make his nogociations and hostilities proceed together; it was not extravagant to think, that his king-craft might at last have saved his ministers from being baffled in their several missions, and contemned by foreign powers. That wise and spirited diplomatist, Sir Henry Wotton, after having in vain pressed James to pursue more energetic measures in support of the elector, not choosing to be converted into an instrument for degrading the national honour, desired to be recalled from his embassy to the court of Vienna.† Who then can be surprised that the disappointed elector should thus

* *Ibidem*, vol. iii, p. 112, 113.

† See *Reliquiæ Wottonianæ*, p. 24. "His sending ambassadors" emphatically observes Weldon, "were no less chargeable than dishonourable, and unprofitable to him and his whole kingdome; for he was ever abused in all negotiations, yet he had rather spend 100,000*li.* on embassies to keep and preserve peace with dishonour, than 10,000*li.* on an army that would have fixed peace with honour."—*Character of King James*, p. 8.

give vent to his indignation at the poltroonery of his father-in-law: "If his Majestie would have bestowed the money which he hath spent in treaties, and upon the Navy to Algiers in behalf of the Spaniards, upon his daughter and children, their inheritance had been preserved, and need not to have sued to their enemies; whereat his majestie was offended not a little." *

After this statement, we think there is no occasion to waste any more words in proving, that the first part of Burnett's paragraph is supported by the best authorities of the day. While in respect to the latter, nothing can be more demonstrative of the malignant spirit with which the whole of Higgons' book is written, than what we shall now quote. The following sentences may be regarded as specimens indeed of that compound of audacity and falsehood hardly to be matched even in those writers who are most notorious for their partiality and unfaithfulness:—"In the first place; we must consider that the behaviour of Fredric towards his father-in-law was so disrespectful, in not asking his advice in a matter of so great consequence, nay not so much as acquainting him with his resolutions to accept the crown of Bohemia, as might make King James, and not without reason, the cooler in his concerns. Yet notwithstanding the justice of any resentment which he might have on this occasion, we find that this prince, left no stone unturned to serve the Palsgrave, by mediations, treaties, and advantageous proposals, made to the house of Austria, in order to restore him to his patrimony, though he could not in honour support his pretensions to the crown of Bohemia, the possession of which had been founded on a revolt of the Bohemians from their lawful prince the emperor, but without any considerations of the divine right of kings, as our author pretends, he had better reason to justify his conduct; his experience had shewn him how fatal this politic in queen Elizabeth had been to his own mother."†

Precisely and distinctly we shall endeavour to prove, that the very reverse of all this is the true state of the facts. In the Harleian Manuscript, 1583,‡ there is preserved the original of the Baron Donas' letter to Buckingham, including a copy of the offer of the crown by the states of Bohemia, dated at Prague, 11—12, August 1619. The same volume also contains a letter§ from Frederic to James, dated Wolfenbuttle, 31st January, 1621, in which he assigns to the king

* See Ellis's Letters, second series, vol. iii., p. 238.
† *Remarks*, p. 24.
‡ Fol. 210.
§ Fol. 219.

his reasons for receiving the crown from this brave people; while the charge against James, repeated in many different modes and supported by various assertions, of his having sacrificed the interests of Frederic to the projected marriage of his son with the Infanta of Spain, from which he anticipated such mighty advantges, but none of which he obtained,* renders perfectly ludicrous the declaration of Higgons, that to borrow his own dignified phraseology, "he left no stone unturned, to save the Palsgrave by mediations, treaties, and advantageous proposals to the house of Austria."† Nor could that critical enquirer into the foreign and domestic history of these times be so grossly ignorant as not to have known, that when the States of Bohemia determined to proceed to the election of a new king, upon Ferdinand being chosen king of the Romans, their unanimous choice fell upon the Elector Palatine. Equally notorious was it, that this prince hesitated for some time to accept the diadem which they had so earnestly wished to place upon his brow. But being urged by his uncle, Prince Maurice, and the Duke de Bouillon not to decline that which proved to him a fatal gift, and finding that the majority of his allies were favourable to the wishes of the states, he consented to be crowned together with his consort at Prague. So eager however is this censor to catch at any statement of Burnett's which might exhibit him in a disadvantageous light, as a man, or an author, that he shuts his eyes to facts familiar to the merest compiler of history.

We have already shown the invariable repugnance in James to display that powerful interposition for his son-in-law which feeling and sentiment, as well as prudence and equity, seem so obviously to have demanded. Can it be matter of astonishment, therefore, that

* Whoever has studied the reign of James the First, well knows that the alleged reason of the match being so long delayed, viz. the necessity of a dispensation from Rome for the marriage of an Infanta with a Protestant Prince, was a mere pretext on the part of Spain, to gain time for the execution of its selfish and ambitious projects. Lord Herbert addressed a long letter to the king after the match was broken off, which must have convinced James, unless we are to suppose an incredible silliness on his part, that he had been completely deluded and mocked through the whole affair. See this interesting letter in the Harleian MSS. 1581. Fol.

† A writer of that day has observed with as much truth as force, "that he assumed the title of Defender of the Faith, yet suffered the Protestants of Germany and France to be extirpated. That he might almost have purchased such a country as the Palatinate with the money sent on embassies; and that by his promising the French Protestants assistance, he had only made them confident to their ruin."—Wilson, p. 748, in Kennet, *General History*, vol. ii.

he should so repeatedly have withstood the importunities of the first dignitary of the church in behalf of those who were so near and ought to have been so dear to him? From the first to the last, and at the hazard of incurring the mortal displeasure of his sovereign, Archbishop Abbot was the zealous partizan of Frederic and Elisabeth. In the letter addressed by him to Secretary Naunton, he strongly urges, "that there should be no going back, but a countenancing of the new king against all the world;" while the following suggestion of the patriotic archbishop must have been as unpalatable to the favourites of James and himself as the bitter waters of Marah to the Jews:—"We must try once again what can be done in this business of a higher nature, and all the money that may be spared is to be turned that way. And perhaps God provided the jewels that were laid up in the Tower to be gathered by the mother for the preservation of her daughter, who, like a noble princess, hath professed to her husband not to leave herself one jewel, rather than not maintain so religious and righteous a cause."* But notwithstanding the whole church with its primate was here inclined to be militant, the following eminently trust-worthy documents will prove that this base-minded sovereign still preferred truckling to Count Gondomar, the celebrated Spanish ambassador, who, like his other dictator, Buckingham, really ruled him at times with a rod of iron, though the pageant of royalty, enthralled as he was by one or the other of his vicegerents, could luxuriate in the idea—for the idea was a belief—that he stood all the while in as proud a position as if the chief potentates of Europe were his tributaries. And even when there were indications of his putting forth something stronger for the interests of his son-in-law than state papers and remonstrances, he soon stopt from fear, or started back from fickleness. King James, says the French ambassador, Jilliers, "throws the affairs of Bohemia into confusion every way, and says sometimes one thing, sometimes another." The same authority again tells us—"The Col. Gray has received permission to levy 1000 men for the King of Bohemia, and has placarded it every where in London, even on the door of the Spanish ambassador, that it is open to every man to take service with that king. Beyond doubt, Gondomar will rouse all the louder complaints of this, knowing how much may be obtained by that method from James. In the end, the latter will sacrifice the colonel in order to satisfy the ambassador," while another report from the same says, "he dare

* See *Biog. Brit.*, art. Abbot.

not, out of fear, to the Spanish ambassador, openly recommend the support of the Palatine."*

Thus did this most self-degraded of kings, in the highest and deepest sense of the word, whilst he was in his own eyes next to omnipotent—for he had the impious audacity, in one of his lecturing harangues to the Commons, to call himself "a God on earth"—not only bring upon his own person the ribald jest, the sneers, the taunts, the sarcasms and pity of all Europe, but even subjected the elector and electress to the same systematic and mortifying attacks, by his cowardice, by his inveterate habits of wavering and infirmity of purpose, by his low and tricky expedients—in a word, by his total incapacity to preserve to the name and character of England that high station which she had so lately held among the great nations of Europe. "The Spaniards," says Coke, "in their comedies in Flanders, imitated messengers bringing news in haste, that the palatine was likely to have a numerous army on foot, for the King of Denmark would shortly furnish him with 1,000 pickled herrings, the Hollanders with 100,000 butter boxes, and England with 100,000 ambassadors. They pictured King James in one place with a scabbard without a sword; in another, with a sword which nobody could draw out, though divers persons stood pulling at it. In Brussels, they painted him with his pockets hanging out, and not a penny in them, and his purse turned upside down. In Antwerp, they pictured the Queen of Bohemia like a poor Irish mantler, with her hair hanging about her ears, her child at her back, and the king (James) carrying the cradle after her; and every one of the pictures had mottos expressing their malice."†

We proceed now to the most reprehensible of Burnett's attacks upon the memory of King James, in the estimate of Higgons; and certainly we are not in the least surprised that it should have called forth the strongest indignation from the pen of this staunch advocate of the Stuarts. At first sight, in the passage we are about to quote, there is something so highly offensive and outrageously indecent, as if the rancour of Burnett not only delighted to persecute the king with instinctive eagerness and unrelenting hostility, but was not tired of even treading upon his dust, that it is difficult to prevent our reason from being overpowered by our passions and natural impressions:—"Eight years before that time, King James, on a secret jealousy of the Earl of Murray, then esteemed the hand-

* *Hist. of the XVI. and XVII. Cent.*, by Raumer, vol. ii, p. 240, 241.

† Roger Coke's *Detection*, vol. i, p. 126.

somest man of Scotland, set on the Marquis of Huntly, who was his mortal enemy, to murder him; and by a writing, all in his own hand, he promised to save him harmless for it. He set the house in which he was on fire, and the earl flying away, was followed and murdered, and Huntley sent Gordon of Buckey with the news to the king. Soon after, all who were concerned in that vile fact were pardoned, which laid the king open to much censure."* Upon these observations, Higgons exclaims,—"Not content to have laid King James in his grave, he will not let him be quiet there; but, before he begins the succeeding reign, rallies all his malice to give one parting blow. Hitherto he has not dared positively to accuse him but of common wickedness; but now, to take his leave, he boldly and without mincing the matter peremptorily charges that prince with the greatest crime against God and man, a wilful and premeditated murder." "I cannot, therefore, in the least doubt," he observes in another place, "but that the reader is by this time sufficiently satisfied of the disingenuity and injustice of our author, in this barbarous aspersion on the memory of King James VI. If he had been more candid and sincere in the rest of his book, this one story is enough to blast his credit by destroying all opinion of his faith and probity—this one instance is sufficient to show the man and his principles."†

In the historian we do not of course expect to find an inventor, but certainly the reader will require the most authentic evidence for the novelty and boldness of Burnett's assertion; since the crimes of a sovereign prince, when once established, become a kind of public guilt and national ignomony; and therefore should never be broadly affirmed, without the fullest deliberation and conviction, and without the largest allowance conceded to human infirmity and to human error.

If we are to rely upon the judgment pronounced in Archbishop Spotteswood's History respecting this horrid transaction, James is to be considered as perfectly and entirely exculpated from all blame in it;‡ but we must not forget that the fulsomely corrupt sycophancy of this prelate towards the monarch, was reckoned somewhat extravagant in that "king-praising age;" so that his authority, wherever his majesty was concerned, is to be regarded with extreme distrust.

* *History of his own Times*, vol. i, p. 32.

† *Remarks*, p. 38.

‡ He designates it merely "as a commission to apprehend and bring Murray to trial."

Yet no one, however disposed he might be to believe that Burnett at all times prefers the light of truth to the glare of paradox, will tender his suffrage for him on this occasion without some substantial facts. In the following curious document‡ we conceive that the criminality of James is declared as explicitly as words can speak it, averse as the moralist may be from supposing that the acts and deeds of a barbarous system find countenance in the kindred proceedings of more enlightened times:—

"There be two famous houses in the north of Scotland, to wit, Huntly and Murray, the house of Huntly is very mightie in men and goodes, and soe is Murray, but not comparable to the other, as all men knowes. True it is, that neither of the earles are soldiers, yet Murray the most warlike man, both in courage and persone, for he was comly of persone, of a great stature, and stronge of body. Disdayne and injurie, that still invades the minde of man to corrupt all friendly tranquillitie, did all so assayll the good mynde of this valiant Murray; the instrument whereof was Campbell of Caddel, knight, a gentleman of the countrie, whoe the most part of his tyme had spent at court, where hee had learned all the subtilties thereof, not only to his owne greate hurt, but also to the stayne of his posteritie. The knight of Caddell was very familier with the Chancellor Maitland, from whome he received instructions to injender disfriendshippe betwixt Huntly and Murray, and consequently warrs, that distroyes. All the whole commission hee accomplished very learnedly; and soe inflamed the one against the other, that upon a certain day Huntly came with divers of his friends in the sight of the castle of Tarnway, as it were to provoke wars; the which Murray consideringe, commanded his men to shoote; where was slayne a man called Gordon of Clume: after that, the wars increased soe, that at some tyme Huntly, at some tyme Murray was victorious, till at last Huntly tooke occasion to come to court, where hee, and Chancellor Maitland were soe familiar, that first for favour of Huntly, and lastly for hatred, hee had conceived against the name of Stewart, for Bothwell saith hee devised to perswade the king that it was necessarie those two noble men were agreed, for if his majestie should have any thinge to doe against foreigne nations, he woulde accomplish noe goode worke havinge his subjects in division, and therefore willed the kinge to send my Lord of Ochiltry unto Murray, and desire him to repaire to any part neere the court, because Huntly was then present with him, to the end his majestie

‡ See Church *History of Scotland.* Fol. 1655, p. 382.

might the more easily reconcile them. Murray havinge heard the message, simplie beleeved the same, and the messenger knowinge nothinge of the fraude, they came back togeather to a part in the princie of fytt, called Dunebursell, which Murray had chosen for his residence, where my Lord Ochiltry departed from him toward the court to advertise the kynge and the chancellor of the suddaine obegdance that Murray made, but immediately after the kynge by instigation of his Chancellor Maitland, sent commission to all boitts of the queen's ferrie, on back the bords of the river Forth to be all in readines on the south side of the river against the 7th day of February. Thus as the purpose was devised by the said Chancellor and Huntlie, the boates were all readie by commande of the king's letter, and received Huntly, whoe immediately withall expedition and diligence passed the river with horse and men saflie, and after that passed towards the house of Dunebursill where Murray with his mother and quiet household were remayninge for the tyme, accompanied with the Sheriffe of Murray, and there with fire and sworde destroyed him to the death, and then went his way northward. After this the good ladie of Dun, mother to Murray, caused his corps to embalmed with the corps of the said Sheriffe, who was killed with him, and were carryed to Leith; after that shee demanded justice of the kynge, whoe promised it should be obtayned. Huntly was committed to prison, but privilie was assured that hee should not bee hurt, as the end declared, for although he entred into the castell of Blacknes, the 12th day of March, hee was remitted upon the 20th of the same month, express against all justice or equitie, and in particular against the common laws of Scotland. The knight of Caddell was alsoe killed treasonable in the north. At this fact the ministrie and nobillitie were offended in hearte, both against the Prince and his Chancellor, and in speciall, the Earle of Atholl was soe moved, that he made warrs against Huntly, and that by the speciall instigation of Malcolme Tosh, a man unconstant, false, and double minded by the report of all men."

Are there, however, any who will not believe that such fell and implacable hatred had taken possession of James' heart, that he could be accessary either directly or remotely to an act upon which all must look with horror—the murder of a young nobleman of the most promising virtues, the heir of the regent, Murray, and the darling of the nation?* They will readily be disposed to receive the

* Matchless for beauty as valour, to the former gift he is said to have owed the loss of his life.—See Douglas's *Peerage of Scotland*, vol. ii, p. 258. There is a Scottish ballad extant which, beginning with these words,

following document* as one of more intrinsic historical value than that to which we have just referred. We will not agitate this question, but intreat the reader to believe us, as willing as himself can be, to admit all possible palliations for the conduct of James; since it never can be matter of indifference to this country that the memory of any one of its past kings should undeservedly be consigned to infamy. We will, then, only contend that the first cited document contains a triumphant refutation of the charge, that Burnett here exhibits that perverse fecundity of imagination which leads a man to invent circumstances such as nothing but the grossest prejudice or infatuation could have invented. "The 7th of February, 1592, (beginning the yeir in January), the Earle of Huntly and his followers killed the Earle of Muaray at Duninbarste (for) the slaughter of John Gordone, brother of Sir Thomas Gordone of Clunie, committed by the Earl of Muaray at Turnolbay, the — December, 1590, the Earle of Huntly obtayned a comisso from his majestie to pursue such as did manteyne or harbour the Earle of Bothwell, by virtue whereof he proceeded against the Earl of Muaray, as ane harb— of him. Whereupon ther sprang a great heartburning and deadlie feud—Huntlie and the Earle of Muaray's friends."†

We are, lastly, told by Higgons, that Burnett worries King James as he did his grandson, Charles II., with a most rabid fury, because he affirms "it is certain no king could die less lamented or less esteemed than he was." But he who looks calmly and comprehensively at the conduct of this monarch with respect to his mother, to Raleigh, and to Somerset, will find great difficulty in believing it

"O! bonny Earl of Murray
He was the queen's love,"

gives an appearance of reality and strength to some historical charges of his having carried on a criminal intercourse with the queen. But even admitting her majesty's gallantries, which have been so pointedly glanced at by several of her cotemporaries, could be verified, a more lawful species of retributive justice might surely have been resorted to by the king, than that barbarous one recorded in the narrative of our text.

* *The History of James, the Sixth King of Scotland, with the instability of his Regents, and their unhappy Ends.*—Harleian MS., 681. Robertson seems not to have been acquainted with the paper to which we have referred. His account of the transaction, therefore, tallies with that of Spottiswood. But the well-known prepossessions of that popular historian in favour of the Stuart line, particularly of the unfortunate Mary, would not render him very anxious to confirm by new evidence the statement of Burnett.

† *The Slaughter of the Earle of Muaray,*—See MS. in the Cottonian Library, *Caligula*, D. i, fo. 1535, apparently written about the time.

to be capable of vindication, however the partiality of interest and feeling may give rise to an infinite diversity of moral judgment in our estimates of principles and actions.

A very capable judge, speaking of Burnett's *History of his own Times*, has observed, that "this work of great instruction and amusement is the more interesting, as he seems to have relied almost entirely on his memory, and very little on the public relations of the events he relates. We have thus the impression of what was passing, as he received it from conversation and general opinion, instead of a mere detail of facts, gleaned from the Gazette, and drawn upon the facts without colour or perspective."* The truth of these observations, we think is strikingly illustrated in the different accounts given by Spottiswood and Burnett, of James's behaviour on the tragical death of his mother. In the following statement of the Archbishop†, it is evidently his object to make the reader believe that James, in the fulness of his grief and indignation at her death, was resolved to come forth with the might of an avenger—to declare open war against Elizabeth, if his particular favourites had not exerted their influence to prevent him from adopting a measure so natural in his situation. "When queen Elizabeth understood that the messenger whom she had sent with a letter to the king, excusing the fact of his mother's death, was returned without audience, she laboured by her ministers, of whom she was ever well furnished, to pacify his mind, and direct him from the war he had intended. These working privately with the king's chief counsellors, and such of his chamber as he was known to affect, dealt so, as they kept off things from breaking forth into open hostility, which was every day expected." Whereas Burnett, in recording this delicate and important transaction does not hesitate to say—"It is true, king James sent one Steward, the ancestor of the Lord Blantyne, who was then of his bed-chamber, with an earnest and threatening message to Queen Elizabeth, for saving his mother. But in one of the intercepted letters of the French ambassadors then in Scotland found among Walsingham's papers, it appears, that the king, young as he was then, was either very double, or very inconstant in his resolutions. The French Ambassador assured him, that Steward had advised the queen to put a speedy end to that business which way she pleased; and that as for his master's anger, he would soon be pacified, if she would but send him dogs and deer. The king was

* See *Memoirs of the Affairs of Europe from the Peace of Utrecht*, p. 376.
† *History of the Church of Scotland*, book vi, p. 359.

so offended at this, that he said he would hang him up in his boots as soon as he came back, yet when he came back, it was so far from that, that he lay all that night in the bed-chamber."* It is surely no strained supposition to conclude that there must be falsehood at the root of one of these accounts; and it will be found, we suspect, to lie on the side of the Archbishop. For if we look into other contemporary writers on this subject, we shall perceive Burnett's assertions to be confirmed with a graphic and circumstantial accuracy, which affords cogent proof that Spottiswood exercised all his ingenuity, to keep the real fact out of sight; in other words, that his is a gross and palpable misrepresentation. But the reader shall judge for himself: "Lord Hamilton having been employed by Courcellis, the French Ambassador, to speak to James of his mother's danger. "The king's answere was, that the queen, his mother, might well drink the ale and beere, which herselfe had brewed; further, that having bound herselfe to the queene of England to doe nothing againste her, she ought to have kept her promise; notwithstandinge, that he woulde no waye faile in his dutie and naturalle obligatione he oughte her." To Sir George Douglas, who represented how discreditable it would be to allow Elizabeth to put his mother to death, the king said, that "he knew she bore him no more good will than she did the queen of England; and that in truth it was meete for her to meddle with nothing but prayer and serving of God." The earle of Bothwell being asked by the king what he should do, if Elizabeth asked his consent to proceed against his mother, said "yf he did suffer, he were worthye to be hanged the nexte day after:' whereat the kinge laughed, and said he would proceed, for that 'the nobilitie believe indeed that ther is some secret intelligence between the queene of England and the kynge, which is the rather confirmed because the kinge's secretaire and grawe mene onlie made privie to the said Reiths instructions; and the master of Gray's embassy confirms them on this opinion, and that the kinge of Scotts will not declare himselfe openly against her (Elizabeth) though his mother be put to death; unlesse the queen and the Slatts would deprive him of his right to the crowne, which himself hath uttered to Earle Bothewell and Chevaliere Seaton.' Alexander Stewart, sent in the company of the ambassadors 'with more secret charge,' had said to Elizabeth were she even deade, yf the kinge at first shewed himselfe not contented therewith they might easilie satisfy him, in sending him doges and deare. On being informed of this,

* *History of his own Time*, vol. 1, p. 542.

the kyng was in marvelose collore, and sware, and protested before God, that yf Steward came, he woulde hange him up before he putt off his bootes, and yf the queene meddled with his mother's life, she shoulde knowe he would follow somewhat else than dogges and deare.' Courcellis expresses his fears, that, if Mary's execution should happen, James would digeste it as patiently as he hath done that which passed between the queene of England and Alexander Stuart, whose excuse he hath well allowed and veseth the man as well as before."*

Within three months, indeed, of his mother's execution we learn from a letter of the Ambassador Randolph to Secretary Walsingham, that " he (the king) determined wholly to depend upon her majesty; and to run her fortune against the whole world:" He departed suddenly from Edinburgh to Falkland, merely " to see the deer, that her majesty had sent him, to be taken out of the carts, and put into the park, but with one little void in his wishes. He hath prayed me, says Randolph, that, by your honour, her majesty may be moved to lend him, for the space of two months, a couple of her majesty's yeomen prickers; and a couple of the grooms of the leash. He prayed me also to put your honour in remembrance of some horses and geldings."† No one can doubt, after reading these extracts, that, however keen may have been the feelings of James at the fate of his mother, they were not of very long duration; and the following anecdote would completely and indisputably establish the reported fact, that instead of having his mind wrung with agony on the subject, he rather could permit, nay even encourage, others to display their irony and humour in allusion to it, without seeming to be at all aware, that, in tolerating this jocularity, he was subscribing indirectly to the truth and righteousness of her condemnation. " Soon after the execution of Mary, Melville happened to be introduced to his majesty. James appeared to be in great spirits; laughed, and frisked, and danced about the room, in the boyish manner which he retained, long after he came to man's years. The contrast between this levity, and the sable attire of the company and apartment, struck Melville's fancy, and brought to his recollection the way in which Mary was said to have mourned for the murder of her husband. He expressed his feelings in an impromptu to a gentleman of his acquaintance who stood beside him. The king seeing them smile, came forward and eagerly enquired the cause of

* See M'Crie's *Life of Melville*, Note cc, vol. i, p. 461.

† Ellis's *Letters on English History*, second Series, vol. iii, p. 123.

their mirth. The gentleman excused himself by saying that it was merely a sally of the principal's humour, which had extorted a smile from him. His Majesty then applied to Melville, who felt averse to gratify the royal curiosity, but James, insisting on his demand, and promising not to resent any freedom that might have been used, he repeated these lines:—

Quid sibi vult tantus lugubri sub veste cachinnus
Scilicit hic matrem deflet; ut illa patrem."[*]

But if it be pertinaciously asserted, that we here lay too much stress upon a few isolated examples, and that further corroboration and argument are necessary to convict James of that moral depravity at which so many of his subjects stood aghast, we will call the attention of the reader to the following curious document, as it proves, first, the irresistable or rather unresisted ascendancy which Elizabeth wielded over James, by indulging him with ample supplies of money; and secondly, that as they were granted within the very year of his mother's execution, it mattered not whether the English queen announced weal or woe to him, respecting her fate,† provided she filled his empty coffers. "Memorandum, that *Anno Domini*, 1585, I was sente into Scotlande by her majestie, to the kynge there. I receavede by her majesty's order, out of th' eyschecker, £2000, to be employed for her highnesse's service upon the noblemen and other then at my discretion and as I found cawse, which sum of monie I bestowede as then as I was wylled, and as the same was employed from tyme to tyme advertised by my lettres to Mr. Secretary Walsingham, as in some of my lettres of that yere unto his honour it might appere, as also be found in some notes or copies of lettres wrytten by myselfe and yet remayninge amonge wryttinge of Scottysshe cawses, for the tyme of my beinge ther in that yere. This I wryte for my discharge; for that other accompte I cannot make none, nor yet of the £4000 which I delivered unto the kynge selfe by lyke commandments from her majestie in A. D. 1586, for that in such cases, nether princes gyve bylles of their handes, nor any other that receave the lyke rewards or guifts from princes, for

[*] See M'Crie's *Life of Melville*, vol. i, p. 286.

† If it be true, that Mary betrayed such an unnatural hardness of heart, as not only to disinherit her son, but to enter into a conspiracy for kidnapping and delivering him a prisoner to the Spanish Monarch, from whom his liberty was only to be purchased at the price of his turning Roman Catholic, (See *Murden Papers*, vol i, p. 84,) it is not so surprising in James to have cared so little for such a mother.

daynger or reproche unto themselves for receavinge of the same. Sondrye other tymes since her majesties reign, I have receaved divers other great soms of monie, to be delivered as well to my L. of Murraye as my L. Moreton and other, for which I have no bylles of ther handes to shewe nor was ever wylled to demande anye, but by my lettres advertisede of the payment ther of, and therein my word and wrytinge sufficientlie creditede, as also suche monie as at sundrye tymes I have geven for intelligens, and non farther accompte made then my owne worde and credit, as the lyke is used to all other embassadors in her majesties service.

"Two thousand pounds I delivered to Mr. Robert Browne, for which I have a bylle of his hande.

"Wrytten by me, the 8th of October, 1587, at my house in London.

"THOMAS RANDOLPH."*

Perhaps we may be here reminded, that James could not be so profoundly insensible to the unredressed wrongs of his parent as is represented in this singular paper, because Strype† has quoted from the Cottonian library the following declaration of James:—"I am unable to revenge the heinous murder committed on my dearest mother. First, in respect to my tender youth, not trained up in dexterity of arms, either to withstand injuries, or to conquor my own right; being at all times bygone detained in captivity. Next my excessive cowpit (cupidity) from hand to hand, from needy to needy, to greedy and greedy; having sufficient patrimony and casualty, and yet as none at all in store."

Who now can fluctuate in opinion, unless they impugn the authenticity of the paper here quoted, that his mother's death made no more impression upon James than the spray upon a rock, or the pleasure of melody and harmony upon a deaf man? especially when it is remembered that his filial sensibilities were so torpid as to grant pardon to Archibald Douglas, one of the murderers of his father, and still more to outrage public opinion immediately afterwards by nominating him ambassador to England.‡

If history did not record the fact, from the reason of the thing itself, and the ordinary workings of humanity and justice, could there be a doubt that there should be one cry of unmingled reprobation throughout the land when Sir Walter Raleigh's head was

* See Ellis's *Letters on English History*, second series, vol. iii, p. 124.

† See his *Annals*, vol. iii, p. 382.

‡ Miss Aikin's *Memoirs of the Court of King James I*, vol. i, p. 17.

sentenced to be cut off? It was no wonder then that Burnett should say, while sympathizing with the fate of this illustrious victim to sceptred hatred and tyranny, that "the first condemnation of Sir Walter was very black, but the executing him after so many years and after an employment that had been given him, was counted a barbarous sacrificing him to the Spaniards."* Most readers of English History are aware that Sir Walter Raleigh was accused of conspiring to overthrow the government, and to place Arabella Stewart on the throne. But no satisfactory clue has been afforded to this revolutionary labyrinth. In what manner the whole machinery of insurrection was to be directed, when the contrivers of it were so much at variance with each other in their religious and political principles, history has in vain attempted to discover. Upon a paper, however, purporting to be the examination or confession of Lord Cobham, the supposed originator of this great political achievement, Sir Walter was convicted of high treason.† A publicist, or lawyer of the present day, whether whig or tory, would be seized with mingled emotions of surprise and disgust, who should for the first time read, that when Raleigh insisted that two witnesses were indispensable to prove the fact of his imputed guilt—that the common law, the statute law, and the law of God‡ alike required such evidence—and that the witnesses ought to appear in court and be confronted with the accused, the judges had the audacity to declare that the statutes of the 1st of Ed. VI, and 5th and 6th of Ed. VI, were repealed.§ But how would those sensations be

* *History of his own Time*, vol. i, p. 29.

† For the report of the trial, see the conclusion of Oldy's Life of Raleigh, prefixed to the best edition of his *History of the World*, and Phillip's *State Trials*, vol. i, p. 83.

‡ "At the mouth of two witnesses, or three witnesses, shall he that is worthy of death be put to death; but at the mouth of one witness he shall not be put to death."—*Deut.*, chap. xvii, v. 5.

§ In the opening days of free discussion, Sir John Hawles, a solicitor general in the reign of William III, in his passion for justice and wisdom, has warmly asked, "I would know by what law is the deposition of a person who might be brought face to face to the prisoner, read as evidence; I would know by what law it is forbidden that the accuser should be brought face to face to the accused; I would know by what law Brook's deposition of what the Lord Cobham told him of Raleigh—I would know by what law the story Dyer told of what an unknown man said to him at Lisbon of Don Raleigh, was evidence against Raleigh; I would know by what statute the statutes of the twenty-fifth of Edward III, and fifth of Edward VI, are repealed."—See *Reply to Sir Bartholomew Shower's Magistracy and Government of England vindicated*, p. 32; and Winwood, vol. ii, p. 8, 11. This crown officer and

increased, when he had been told that that miracle of juridical learning, Sir Edward Coke himself affirmed that those noble statutes were no longer in force, which it is well known exacted that no mortal judge should consign a fellow creature to death without the witnesses being brought into open court, face to face before the accused! Well might the able and learned prisoner exclain, "You try me then by the Spanish Inquisition, if you proceed on examination, not on witnesses." The jurist-consult would also mourn, that Coke, who acted on this memorable trial as attorney general, in his overboiling animosity and hatred towards Raleigh—for the epithets monster, vile viper, execrable traitor, spider of hell, damnable atheist,* were applied by him to the prisoner, in his opening speech—

most upright man was a great advocate for the distribution of uncostly justice, and from his remarks on Colledge's trial, appears to have held in distrust the *private opinions of king's counsel* on great constitutional points, conceiving "that they made themselves partys in such matters."—See 8 *St. Tr.*, 723.

* Most unjustly, Sir Walter has passed with his contemporaries for a free-thinker; which opinion Mr. Hume has sought to perpetuate by charging him with infidelity—a charge which came with no peculiar fitness from this quarter; and many writers, upon his authority, have chosen to take from him the noblest prerogative of his nature, that of being "*a religious animal.*" Dr. Parr, who has examined the writings of Raleigh attentively, has rebuked Mr. Butler for adopting that notion of the sceptic historian:—"Why do you follow Hume, in representing Raleigh as an infidel? For heaven's sake, dear Sir, look to his Preface to his *History of the World*; look at his *Letters* in a little 18mo, and here, but here only, you will find a tract which led Hume to talk of Raleigh as an unbeliever. It is an epitome of the principles of the old sceptics; and to me, who, like Dr. Clarke and Mr. Hume, am a reader of Sextus Empiricus, it is very intelligible. Indeed, Mr. Butler, it is a most ingenious performance: but mark me well—it is a mere *lusus ingenii.*"—Butler's *Reminiscences*, vol. ii, p. 232. But did not the writings of this remarkable person contain internal proof of the habitual conviction of his mind that Christianity was true, the weight of evidence and argument in favour of Raleigh being a believing christian is great from this fact alone, that the companion of his studies and sharer of his toils in the new world, Thomas Hariot, was eminently such. "Many times," says he, "and in every towne where I came, according as I was able, I made declaration of the contents of the Bible, that therein was set forth the true and onely God and his mightie workes; that therein was contained the true doctrine of salvation through Christ, with many particularities of miracles and chiefe points of religion, as I was able then to utter and thought fit for the time. And although I told them the book materially and of itself was not of any such virtue, as I thought they did conceive, but onely the doctrine therein conteined, yet would many be glad to touch it, to embrace it, to kisse it, to show their hungry desire of that knowledge which was spoken of."—Harriot's

should have denied a doctrine which his calm and settled opinion afterwards so fully admitted.* We have his full admission, which has since been confirmed by volumes of English law, that a single witness was not sufficient to convict a person of high treason; yet, in expounding the rationale of the ancient doctrine, in that respect, it would have been most satisfactory to the philosopher and philanthropist if he had explained why two witnesses are required to prove the guilt of treason, and but one only if the indictment refer to any other capital felony.

We are told that Raleigh came to his trial with all the signs and symptoms of his being the most unpopular man in England; but the close of it converted him into the most popular. Now, it costs us no effort to believe this assertion perfectly consistent with the truth, if we keep in mind these two preliminary facts to it:— first, that the information of one witness sworn, retracted and re-sworn— and that witness, Cobham, his friend and accomplice—but not produced, was the evidence against Raleigh: and, secondly, that the self-command, the noble bearing, the legal skill, the tact and pointed quickness of reply, and precision and polish of expression, displayed by Raleigh at this crisis of his destiny, extorted even the admiration of one who seems to have had no respect for the personal character of this extraordinary man. "Sir Walter Raleigh served for a whole act, and played all the parts himself. He answered, indeed, with that temper, wit, learning, courage, and judgment, that, save that it went with the hazard of his life, it was the happiest day that ever he spent. And so well did he shift all advantages that were taken against him, that were not *fama malum gravius, quam res,* and an ill name half hanged in the opinion of all men, he had been acquitted."† Such, in short, was the superlative exam-

Narrative in Hackluyt's *Collection of Early Voyages, &c.*, vol. iii, p. 338. But the verses of Sir Walter, entitled My Pilgrimages, are alone sufficient to prove his believing view of the cross, or of the high mediatorship opened between God and man in the New Testament.—See Cayley's *Life of Raleigh*, vol. ii, p. 159.

* "*Sic libere animam meam liberavi,*" 3 Inst. 27, are the words of Sir Edward, after pronouncing, in the most authoritative tone, that the statutes of 1 Edw. VI, and 5 Edw. VI, had never been repealed. Pity it was, that his conscience had not extorted this memorable confession from him during the trial; for then, at the close of it, he would not have been so frenzied with the passions of hatred and revenge, as impiously to exclaim, "Now Jesus Christ shall be glorified."—See *Secret Hist. of Court of James I*, vol. i, p. 159.

† See Letter of Sir Dudley Carleton, in the Hardwicke *State Papers*, vol. i, p. 378.

ample of capacity and invincibility of temper exhibited by Raleigh, that a Scotchman, who was appointed to make a report of the proceedings to the king, declared that, previously to Sir Walter's entering upon his vindication, he would have travelled a hundred miles to see him hanged in the morning, and would have gone the same distance to save his life before they separated in the evening.

The circumstance of Raleigh stabbing himself upon his committal to the Tower, is broadly assumed as an attestation of the truth of the charges that could be brought against him. But the inference, we think, is more logical and correct, that, in utter despair of his acquittal, from the dishonourable practices resorted to for his condemnation, the fierce and haughty soul of this "rare renowned knight," (as he is quaintly styled by Howell, the celebrated letter writer), could ill brook to remain on earth a living monument of the tyranny of James, and of a systematized series of goading annoyances from his prime minister, Cecil;* and that, therefore, having so much of the old Roman spirit, he attempted self-destruction. More is not necessary to be said to prove the total disregard of justice in the administration of the law towards Sir Walter, which, indeed, the government tacitly acknowledged, since upon no other principle can be explained the grant of a reprieve to this distinguished man after his conviction. So, then, those who hold the protection of our legal rights or good laws well dispensed to be the nerves of the state (to borrow the figurative language of Bacon), must allow that there is great truth in the remark of Burnett, that "the first condemnation of Sir Walter was very black;" while there cannot be the smallest doubt as to the propriety of his second observation, that "executing of him after so many years, and after an employment that had been given him, was counted a barbarous sacrificing him to the Spaniards." It seems, indeed, to be supposed by certain writers, that James proceeded to extremities against Sir Walter for some alleged misconduct in South America. "You might think it heavy," said the tool and minion of the court, the Lord Chief Justice Montague, in passing sentence upon him, "if

* The never-to-be-forgiven offence of Raleigh was, presenting a memorial to James, at his accession, in which, says Kennet (*Complete History of England*, vol. ii. p. 663), "with a singular bitterness of style, he vindicates Queen Elizabeth from the death of Mary, and lays the death of that unfortunate queen chiefly at the door of Cecil, the monarch's minister, and his father; for which he appeals to Davison, then in prison, the man that had despatched the warrant for her execution contrary to Queen Elizabeth's express command."

this were done in cold blood, to call you to execution. But it is not so. For *new* offences have stirred up his majesty's justice to remember to revive what the law hath formerly cast upon you." "With those new offences, however," observes an acute and learned writer, "whatever they might be, he was never publickly charged; yet was he accused without a public prosecutor, and condemned without a trial."* These few short facts illustrate the cruelty and illegality of his sentence. After fourteen years imprisonment, Sir Walter received from the king the command of a fleet, to be employed in discovering a gold mine in South America. The expedition proved unsuccessful; and upon his return home, after a solemn mockery of conference, held by all the judges, upon his case, he was decapitated under the authority of a special warrant, signed by the king, in direct opposition to the soundest principles of justice and humanity. For if the conclusion of the law be true, that authority and confidence cannot be bestowed upon a traitor condemned to death, then the royal commission of admiral† was equivalent to a formal pardon. But as a crowning characteristic of the black deposit of inveterate antipathy and pernicious passion that was lodged in the bosom of James against Raleigh,‡ it may be mentioned, that he absolutely made it a merit with the court of Madrid§ that he

* Philips's *State Trials*, vol. i, p. 79.

† Confirmatory of this position, is the following address of Bacon to Sir Walter:—"Sir, The knee limber of your voyage is money. Spare your purse in this particular, for, upon my life, you have a sufficient pardon for what is past already, the king having, under his broad seal, made you admiral of the fleet, and given you power of martial law over your officers and soldiers."—See Howell's *Letters*.

‡ How bent James must have been in pursuing his victim to death, when Queen Anne penned the following curious letter to Buckingham, and yet neither she nor the favourite could elicit a particle of compassionate feeling in the royal breast towards the prisoner. "My kind dog, If I have any power or credit with you, I pray you let me have a trial of it at this time, in dealing sincerely and earnestly with the king that Sir Walter Raleigh's life may not be called in question. If you do it, so that the success answer my expectation, assure yourself that I will take it extraordinary kindly at your hands, and rest one that wisheth you well, and desires you to continue still, as you have been, a true servant to your master."—Dalrymple, vol. i, p. 78.

§ In the following extracts, the infamous policy of James, in this respect, will appear to be fully developed:—"But withal, I shall judge them (the Spaniards) the most unworthy and perfidious people of the world; and the more for that his majesty hath given them so many testimonies of his sincere intention toward them, which he daily continueth, as now of late, by the causing Sir Walter Raleigh to be put to death, *chiefly for giving them satis-*

had shed the blood of this variously gifted* person to afford them unmodified satisfaction.

Of Mr. Hume's disposition to praise, at least to cast a friendly shade over the worst actions of the Stuarts, no one who has even glanced at his narrative of their reigns can doubt. Having enlisted himself, then, as their willing champion, he was in duty bound with much pains to vindicate the father of that singularly unfortunate line, in what related to the execution of Raleigh: but, on this occasion, he has mustered a very incompetent defence. The principle momenta of his argument rest upon a "declaration by authority" put forth at the time, to the averments of which he claims implicit credence, on the ground of its being subscribed by six privy councillors. Now, it has long been a settled point with the curious readers of English history, that as little can be said in praise of Hume's researches as of his fidelity. We have, therefore, thought our time not ill spent in investigating a matter of great importance,

faction. Further you may let them know, how able a man Sir Walter was to have done his majesty service, if he should have been pleased to have employed him. Yet, to give them content, he hath not spared him; when, by preserving him, he might have given great satisfaction to his subjects, and had at his command upon all occasions as useful a man as served any prince in Christendom."—See Rushworth, vol. i, p. 96. After this letter, it surely ought not to be enumerated among the paradoxical positions advanced by Sir Walter, without any degree of scrupulosity, that the king had disclosed the whole design of his voyage to Gondomar; since the following passage in a letter from Buckingham to Winwood so clearly establishes the truth of Sir Walter's accusation:—"His majesty perceiveth by a letter he hath received from the Spanish ambassador, that you have not been with him to acquaint him with the order taken by his majesty about Sir Walter Raleigh's voyage; and therefore would have you go to him as soon as you can possible, to relate unto him particularly his majesty's care of that business, and the course he hath taken therein."—See Hardwicke, *State Papers*, vol. i, p. 398.

* Of his multifarious accomplishments and chivalrous character, Anthony Wood has given the following graphic description:—"Authors are perplexed under what topic to place him, whether of statesman, seaman, soldier, chemist, or chronologer, for in all these he did excel; and it still remains a dispute whether the age he lived in was more obliged to his pen or his sword; the one being busy in conquering the new, the other in so bravely describing the old world. The truth is, he was unfortunate in nothing else but the greatness of his wit and advancement. His eminent worth was such, both in domestic polity, foreign expedition and discoveries, arts and literature, both practive and contemplative, that they seemed at once to conquer both example and imitation. Those that knew him well, esteemed him to be a person born to that only which he went about, so dextrious was he in all or most of his undertakings, in court, or camp, by sea, by land, with sword, with pen."

as it affected the guilt of Raleigh. For his vouchers, the historian refers us to the third volume of the *Harleian Miscellany*, No. 2: but they who are unacquainted with the paper in question, will stare at being told that it bears no signature at all. Not one of the members of the privy council signed it; and what is still more astonishing, from the first to the last page of the paper, it is impossible to find a sentence which can furnish a pretext for the very natural supposition that the declaration at least professed to have their assent or sanction. *Not a word further need be said respecting a paper as remarkable for the plausibility of the arguments as for the force of the expressions, and which was in all probability composed by the royal pen: for though the acquirements of kings are in general magnified, yet whoever examines with attention the *Basilicon Doron*, and the proclamations, speeches, and messages to parliament of James, will agree with Hume, that "he possessed no mean genius." In a case, then, where *self* was so deeply interested, and where the paramount purpose and end was so completely to criminate Raleigh as to make his death appear a sacrifice to public justice, it is presumable, that James was not so enamoured of the character of a tyrant, however he acted with all its blind recklessness on this and other occasions, as to be indifferent to the contempt and abhorrence of posterity, provided that he could escape them by easily taking refuge in the display of his dialectic powers.

It may be said of Burnett, as it has since been said of another eminent man, though of a very different cast of mind (Priestly), that he followed truth, as a man who hawks follows his sport at full speed, straight forward, looking only upwards, and regardless into what difficulties the chace may lead him. In every point of view, then, it would be prejudice, and not sound criticism to assert, that any thing but sincere love of truth led our historian to declare, "that the whole business of the Earl of Somerset's rise and fall, of the Countess of Essex and Overbury, the putting inferior persons to death for that infamous poisoning, and the sparing of the principals, both the Earle of Somerset and his Lady, were so odious and inhuman, that it quite sunk the reputation of a reign that on many other accounts, was already much exposed to contempt and censure; which was the more sensible, because it succeeded such a glorious and happy one."† Yet in thus alluding to the mysterious tale of Over-

* This paper is also published in Somers's Tracts, vol. ii, p. 18; and with it a miserable defence for Sir Richard Stukely, who betrayed Raleigh.

† *History of his own Time*, vol i.

bury's murder, with his usual indulgence to the king, Burnett has failed to notice the great point which so materially tends to criminate him. It will be seen by the following account that the bishop has not mentioned the perturbed anxiety* evinced by James at the menacing speeches uttered by Somerset on his commitment to the Tower; those paroxysms of passion which disclose a mind placed between the rational and the insane. "The king had assured him (Somerset) that he should not come to any tryal, neither durst the king bring him to tryal." This was in an high strain, and in language not well understood by Sir George More (the lieutenant in Elwary's room). Away then goes More to Greenwich, as late as it was (being twelve at night); bounseth at the back stayres, as if mad, to whom came Jo Loveston, one of the grooms, out of his bed, enquires the reason of that distemper at so late a season. More tells him he must speak with the king. Lovestone replyes, 'he is quiet,' (which in the Scottish dialect is fast asleep,) Moore says, 'you must awake him.' Moore was called in, (the chamber left to the king and Moore). He tells the king those passages, and desired to be directed by the king, for he was gone beyond his owne reason to heare such bold and undutiful expressions from a faulty subject against a just soveraigne. The king falls into a passion of tears: 'On my soule, Moore, I wot not what to do! thou art a wise man, help me in this great straight, and thou shalt finde thou doest for a thankful master, with other sad expressions. Moore leaves the king in that passion, but assures him he will prove the utmost of his wit to serve his majesty, and was really rewarded with a suit worth to him £1500."

Now some writers have ascribed the king's extraordinary conduct to guilt, and others to a return of affection for his ancient favorite. Dr. Lingard assigns these emotions to the latter cause; but has hazarded this positive opinion upon a very slender foundation. The stern and bitter exclamation of James at his last parting with Somerset, "The deil go with thee, for I will never see thy face more," is in itself conclusive enough of a breach having taken place between them, which was not to be repaired. And his violent imprecations to Coke, shortly after the arrest of the earl, "God's curse be upon you and yours, if you spare any of them; and God's curse be upon me and mine if I pardon any of them,"† further assist our

* See Weldon and *Archæology*, vol. xvii, xviii.

† See Weldon, *Court and Character of King James*, p. 92, and Coke, *Detection*, p. 78. Little could Somerset have anticipated any prognostics of his

belief, that Somerset was in possession of some important secret, the disclosure of which would deeply affect the honour of the king, even they will scarcely venture to deny whose grand principle is to doubts facts and to differ from generally received opinions. Carte, with his accustomed partiality to the house of Stuart, overlooks the matter altogether; and Hume treats it as a thing of no moment. Truth is not easily dug up; but if Hume had been resolved to toil for it, we question much whether he would have allowed his readers to reap the benefit of his search at the expence of James' character, being so strongly prepossessed in his favour.

Supposing the nature of Prince Henry's disease had not been ascertained beyond the possibility of cavil, it might be fairly conjectured that the idea of being in any way suspected of conniving, though not of participating in the death of his son, was the source of such misery and apprehension to the king. It therefore strikes us, we own, that the threat made by Somerset in his petition to James, the dread * of the king lest he should address the court—his ordering him to be hood-winked and removed from the bar in case he made the attempt, his engaging Bacon the attorney-general so to manage the trial, as to prevent the judges from getting into the real clue of it, are so many concurrent circumstances for the proba-

fallen fortunes when on parting with the king he kissed his hand, and James in return, hung about his neck," says Weldon, "slabbering his cheeks, saying, 'For God's sake when shall I see thee again. On my soul I shall neither eat nor sleep until you come again. The earl told him on Monday, (this being on the Friday). For God's sake let me said the king. Shall I, shall I? Then lolled about his neck. Then for God's sake, give thy lady this kiss for me." Mr. Hallam has observed, "that James was all his life rather a bold liar than a good dissembler'.'—*Const. Hist.* vol. i, p. 319, note. With all due deference to this high authority, we would say that no Joseph Surface could have played both parts more effectively on the stage, than did this royal actor in his palace.

* For prevention thereof, he the king, had two servants placed on each side of him with a cloak on their arms, giving them withall a peremptory order, if that Somerset did any way fly out on the king, they should instantly hood-wink him with that cloak, take him violently from the bar, and carry him away; for which he would secure them from any danger, and they should not also want a bountiful reward. But the earle finding himselfe overreached, recollected a better temper, and went on calmly in his tryall, where he held the company untill seven at night. But who had seene the kinges restlesse motion all that day, sending to every boat he saw landing at the bridge, cursing all that came without tidings, would have easily judged all was not right, and there had been some grounds for his fears of Somerset's boldness; but at last one bring him word he was condemned, and the passages all was quiet. This is the very relation from Moore's owne mouth, and this

bility at least of Sir Walter Scott's opinion, "that James's alarm is to be attributed to a still more flagitious cause than being accessary to the murder of Prince Henry."* And was there not much in the life and conduct of James that deservedly subjected him to the heavy suspicion of indulging in unnatural inclinations? It is related by Osborne, "that Somerset and Buckingham laboured to resemble women in the effeminacy of their dress, and exceeded even the worst in the grossness of their gestures."†

Queen Anne herself, has also some contemptuous but very significant insinuations against the *dear ones*,‡ while the revolting picture drawn by Sir Antony Weldon, and others,§ of James and his dissolute and profligate courtiers, would incline us to believe, that among them, every vice and crime were practised. ¶ But the reply here is, that Weldon was a satirist, and the statement of satirists are to be received with considerable caution and distrust. Time, however, which brings new things to light, has put to rest the question concerning his credibility, since the printing in the *Archæologia*,‖ of Sir George More's letters to the Lieutenant of the Tower. In one of these to which we have before referred, it must be acknowledged, that we met an expression, which certainly does favour the presumption, that James' inquietude of mind arose from the fear of being publickly named by Somerset, as a partner of his guilt in the murder of Overbury; for to prove that this great criminal was the author of it, we can have no clearer or more explicit testimony than his own, in the letter in which he sues for mercy, or rather

told verbatim in Wanstead Parke to two gentlemen, (of which the author was one) who were both left by him to their owne freedome without engaging them, even in those times of high distemperatures, unto a faithful secresie in concealing it; yet though he failed in his wisdome, they failed not in that worth inherent in every noble spirit, never speaking of it till after the kinge's death. See notes to Somers' *State Tracts*, p. 233, 252, 262, &c.

* See Note in his Edition of *Somers's Tracts*, vol. ii, p. 488.

† *Secret History of the Court of King James*, p. 14.

‡ The name of James and woman-hater was considered by many of his courtiers as synonimous. Carte and Birch state on the authority of the French Ambassador's dispatches, that he suffered the women to be presented to him on their knees; while he spoke of them and even of his queen as if they were objects of mingled contempt and disgust.

§ The court was the source and spring "of all sorts of shameful vices," abounding among the higher orders.—See Fulke, Lord Brooke's *Five Years of King*.

¶ There is not a lobby or chamber, if it could speak, but would verify this See Peyton, 369, and Wilson, 728, *apud* Kennet.

‖ Vol. xviii.

demands it from James:—" God knoweis it is only a trikke of ydle brain hoaping thairby to shifte his tryall, but is easie to bee seene, that he wolde threattain me, with laying an aspersion upon me of being in some sorte accessore to his cryme."* There are, however, so many asserted facts in Weldon and other contemporary authorities, which denote that open defiance of the most respectable feelings and the most ordinary decencies in the conduct of James, that the suspicion of his being addicted to a crime, which cannot even be named in a Christian country, rises to its highest point.

In the documents printed in the *Archæologia*, there is also circumstantial evidence of the following remarkable fact, recorded by Burnett, which like many others from his pen, have been so tardily accredited. " King James in the end of his reign was become weary of the Duke of Buckingham, who treated him with such an air of insolent contempt, that he seemed at last resolved to throw him off, but could not think of taking the load of government on himself, and so resolved to bring the Earl of Somerset again into favour, as that lord reported it to some from whom I had it. He met with him in the night in the gardens at Theobald's, two bedchamber men were only in the secret, the king embraced him tenderly, and with many tears. The Earl of Somerset believed the secret was not well kept, for soon after the king was taken ill, with some fits of an ague and died of it."† The results of this extraordinary interview, for so it must be termed, was a free pardon granted to the earl. A memorial drawn up by Somerset evidently at the king's command, and most probably, as Mr. Hallam observes,‡ after this clandestine interview, contains a variety of charges, and some of them very strong ones, against Buckingham. But here the matter ended, whether from James having been reconciled to the duke, or whether his predominant timidity, which made him crouch under every threat, while he seemed to dictate the law, *sic volo, sic jubeo, stet pro ratione voluntas*—despaired of ruining him whom he feared as an enemy, but no longer wished to have as a friend. For never did a subject more completely rule his sovereign, than at this time did his majesty's " poor slave and dog, Steenie." Conceive a prime minister of the present day dispatching this short missive to his royal master:—" In obedience to your commands, I will tell the house of parliament that you have taken such a fierce rheum and

* P. 355.

† *History of his own Time*, vol. i. p. 28.

‡ *Const. Hist.*, vol. i, p. 381, note.

cough, as not knowing how you will be this night, you are not yet able to appoint them a day of hearing; but I will forbear to tell them, that notwithstanding your cold, you were able to speak with the king of Spain's instruments, though not with your own subjects."*

It has been lately said of James by a celebrated writer, "that he was one of those kings whom God seems to send for the express purpose of hastening revolutions." If we are to listen, however, to our homily on wilful rebellion, we shall there find it to be sinful "to rebel even against undiscreet or evil princes;" and very favourable to this position are the words of Lord Bacon:—"Allegiance is of greater extent and dimension, than laws or kingdoms, and cannot consist by the laws merely, because it began before laws, it continueth after laws, and it is in vigour when laws are suspended and have not had their force."†

But it would appear that Bishop Hoadly, like Gallio, cared for none of these things, and thought by a sort of specious acuteness he could cut this knotty point at once, by affirming "that we are only forbidden to resist good governors" in open defiance of the orthodox opinion (for in a bishop we must not suppose it ignorance or forgetfulness,) that the doctrine of non-resistance is promulgated in the clearest and most unequivocal manner by the scriptures. We profess to enter no further upon this deep and dangerous question, than by saying, that we shall be ranked among the most offending, if it be sinful to think, that those high Tory writers who have glossed over the black crimes of James with the gentle epithets of failings or infirmities, thus turning stains into spots, and spots into specks, betray as great a disregard of historical justice, as that minister of religion would of his high calling who should be afraid to call vice, vice; and infamy, infamy. A more striking illustration of this remark cannot be evinced than in Hume's declaration, "that in all history it would be difficult to find a reign more unspotted and unblemished than that of James."‡

Why, if an unquestioning submission "to the powers that be," had not been classed among his religious and political duties, no enlightened Englishmān of that day would have scarcely endured the wantonness of his despotism. At all events, it is impossible, but that he must have felt an inward loathing against a government, whose

* See Hardwicke, *State Papers*, vol. i. p. 460.
+ Winwood, vol. iii, p. 239, and Coke's *Detection*, p. 65.
‡ *History of England*, vol. vi, p. 153.

acts were notoriously influenced by foreign gold ;* a government, under which bishopricks and deaneries were vendible† the most stringent monopolies imposed, not upon nice emergencies only, but as habitual practices; ‡ proclamations quite unwarranted by the ancient customs and laws of the land issued against the personal liberty of the subject upon the most petty § occasions, executions by fire,|| revived on the pretext of an unrepealed statute against heresy, a government under which titles ¶ of honour were openly set up for sale to the highest bidder, the great officers of the state convicted of peculation, **and a lord chancellor, (the heart sickens here to pro-

* *State Trials*, vol. ii, p. 596. It was only by a judicious application of bribes, that Gondomar was enabled to keep those of the Council who passed for sincere Romanists, firm to the union of Prince Charles with the Infanta. —See Wilson and Rushworth, vol. i, p. 19.

† There were, "says Weldon, "books of rates on all the offices, bishoprics, and deaneries in England."—p. 122.

‡ The nation, says Osborne, grew feeble, over-opprest by them.

§ See those for preventing attendance at the coronation and against country gentlemen coming to James on hunting days; and ordering them to leave London and return to their country houses on pain of condign punishment.—Lodge's *Illustrations of British History*, vol. iii, p. 270; and Rymer, vol. xvi, p. 517, 521, 527.

|| Two Unitarians, named Bartholomew Legate and Edward Wrightman, were thus handed over to the secular arm, by James.—See the writ for their execution, in Howell, *State Trials*, vol. ii, p. 731, 736. The third was condemned to be burnt, but his sentence was remitted in consequence of the loud murmurs uttered by the spectators, when the two former atoned for their errors at the stake. Yet James' humanity only extended so far as to mitigate his punishment into imprisonment for life.—See Fuller, lib. 10, p. 62, 64.

¶ In a letter to his *Sowship*, the familiar appellation given to James by Buckingham and published in the Dalrymple papers, vol. i, p. 164, this worthless minister informs his equally worthless master, that he has sold a peerage to Sir Francis Leake, and desires the patent to be signed. No prince, indeed, so much degraded the peerage as James did by selling patents for it at large prices; and when he created the order of Baronets the purchased price for this new species of knighthood, was a thousand pounds apiece. Among the condensed and apothegmatical sayings of James, for we have many of them recorded, one of the most felicitous in expression is the following, "Perceiving a country gentleman approach him in considerable confusion of manner and countenance, to receive his vended honour, he exclaimed, 'What, hold up thy head man, I have more reason to be ashamed than thou."—Miss Aiken's *Life of James I.*, vol. i, p. 164.

** Who can read without high indignation of the impeachment of a Lord Treasurer for bribery. One of the charges against the Earl of Middlesex was of receiving a gratuity for taking off the duty of £3 per ton which he

nounce the name of Bacon,) * impeached for receiving bribes from the suitors in his court. And yet notwithstanding the notoriety of all these disgraceful events, not to say a word of the divorce of Lady Essex, the murder of Overbury, the pardon of his murderer, and the elevation of Villiers, whose public and private conduct when first minister of the crown is synonymous with all that is absurd or execrable, has Hume the hardihood to make the assertion just quoted. That man then, to our thinking, must be made up of irreconcilable contradictions, who after the records of these transactions can affirm, that Burnett's is a judgment uttered by prejudice, when he so emphatically said in speaking of James, " It is certain, no king could die less lamented, or less esteemed than he was."*

M. R. S. L.

CRITICAL NOTICES OF NEW PUBLICATIONS.

A Lecture delivered at the Opening of the Chertsey Literary and Scientific Institution, January 4th, 1838; by the Rev. Robert Jones, D.D., M.R.S.L., Vicar of Bedfont, and Vice-president of the Institution at Staines: 8vo, London, 1838, pp. 38.

WITH their small heads and little minds paralyzed by the virulence of a senseless and shameless vanity, there may be giddy sciolists who, from the profundity of their shallowness, will wish to disparage the style and objects of Dr. Jones' Lecture, by whispering to " birds of

had laid upon French wines. His guilt must have been very manifest; or else the voice of the whole house of peers would not have been against him. Sir Fulk Greville, for the Chancellorship of the Exchequer gave £4000 to Lady Suffolk and Lady Somerset.—Birch, Negociations, 320.

‖ The fairest diamond, says Howell, may have a flaw in it, when alluding to this great man's fall by corruption; but how familiar must that practice have been, when " the master of wisdom" could offer this plea in mitigation of misconduct:—" I hope I shall not be found to have the troubled fountain of a corrupt heart, in a depraved habit of taking rewards to prevent justice; however I may be frail, and partake of the abuses of the times."—See Bacon's affecting letter to the king, in his works, vol. ii, p. 589.

* *History of his own Time*, vol. i, p. 29.

their own feather" that his truly liberal and philosophical discourse contains both "false and dangerous" doctrines. Far different, however, will be its reception at the hands of honest, intelligent and enlightened inquirers after truth and true wisdom; and, that this is greatly the reverse of a vain conjecture, there already exists abundant and gratifying evidence in the document which procured the Doctor's assent to a requisition, that the principles advocated in his "introductory address" might be disseminated in a convenient publication. After "tendering their best acknowledgments" to the lecturer in a special communication through the secretary, the committee of the Chertsey Institution prefer their request, accompanied with these observations:—"From the many topics of local interest, you so happily introduced; from the successful way in which you demonstrated the great benefits to be derived from Literary and Scientific Institutions: and the good counsel you gave us as to the government of our own, the committee feel it would be doing important service to their cause, if you would permit them the pleasure of printing and publishing your Lecture, being desirous to perpetuate the memorable occasion which produced it; also to enable those of their friends who were unavoidably absent, to enjoy the same gratification in reading it as they experienced on its delivery: they feel convinced that its circulation is calculated to do essential good, to convert by its arguments the disaffected, to support the wavering, and to encourage the promoters and members of our Institution to persevere in their good work:" and sincerely do we offer our most devout aspirations for the prosperity of this and all such Institutions as rest their foundations on the sublime truths of Science harmoniously and indissolubly co-operating with the divine precepts of Revelation.

Having opened his discourse with some kind and candid remarks, Dr. Jones proceeds to expatiate, with a fervid eloquence, on the increasing desire for knowledge which gives its bright character to the present age. On all sides, he says, we hear a cry for knowledge: the universities widen their orb of usefulness, and yield to the mental pressure; men of rank, whose easy fortune might entitle them to the choice of hereditary indolence, are now zealous and foremost in pursuit of scientific honours: they engage in the laborious drudgeries as well as the lighter gaieties of literature: the merchant and the tradesman, leaving the hitherto omnipotent allurements of the ledger, now attend the literary and scientific lecture: the spread and sway of cottage learning now enters the humble habitations of the poor: an ardent, unquenchable thirst for knowledge, pervading all ranks, now reaches to all topics of inquiry. Unfortunately, however, there is much alloy in the aliment supplied, in the intellectual pabulum offered, to this urgent and devouring appetite. Many who pander to the unsuspecting innocence of youth and ignorance, either in the open avowal or in the insidious tale, would fain prove that truth is error, that religion is a cheat and delusion. Therefore it is, that the generous Vicar of Bedfont, as a minister of the gospel, comes

forward in the warfare to protect the helpless. This he resolves, and this he courageously avows, that the enemy of our faith shall not have the advantage. Christianity does not forbid or deter its ministers from engaging in any cause of public usefulness: it prohibits no attainment, quenches no talent which, in its lawful exercise, may bring glory to the Creator and benefit to man: never will he consent to leave the mighty armour of literature in the sole possession, to the base distortions and ignorant pollutions, of the unbeliever. This is evident, he concludes, that the mighty mind of a free nation is not to be controlled; it may be encouraged; it may be sanctified; but it cannot be bent to bondage. Say what we will and do what we please, the impetus after knowledge will gather strength. Resist it; deride it; and you have a giant to encounter. On the contrary, meet its wants; graciously administer to its requirements and ambitions; prove that you are generously, ardently, unsuspiciously intent upon its growth and welfare; and the fierce passions shall then be tamed and hallowed; the stubborn proud temper shall yield to your intellect, your sympathy, and your mercy.

To the question, "do your institutions effect this mighty conquest?" the doctor's reply comes in the spirit of the warmest and purest benevolence. Many there be who are blind, though basking in the sun's ray. Shew me a man, he exclaims, in a palace or a cottage, who prizes and cultivates the intellects which God has given him, who is gratefully alive to the precious gift of Mind, with all its privileges and responsibilities, and you shew me a man surely nearer to the great source of all wisdom and knowledge, nearer to the Deity himself, more active in the duties assigned him, than is the fool who scorneth knowledge, who merely eats and drinks, thinks and hopes, and dies like the beast that perishes. Certain it is, and bitterly to be lamented, that talents and attainments are often perverted; but, this too is equally certain, that ignorance is sin and desolation. Certain it is, that education marks out the great difference among men; and this also is too certain, that ignorance has its bigots as well as wisdom and religion. Let the bigots of ignorance cleave to their narrow and gloomy notions: we advocate, encourage and espouse scientific, moral and religious enlightenment: we say, with kind and honest intentions, leave not a parish in this noble empire without a school conducted by a competent master: let every school be supported—not by casual and uncertain bounty—but by the State itself, not superseding individual munificence, but aiding and perfecting its exercise. Let elementary knowledge be as cheap, cheering, and needful as the light of the sun: nothing troublesome or dangerous is to be apprehended from the educated man, brought up in the fear of God: no, no; it is the European savage with a seared conscience, with a perverted and contracted mind, with a cold and cruel heart; it is he who tramples upon divine and human

laws; it is he who makes a mock at sin and scoffs at knowledge; he it is who, being a savage above all others, is to be dreaded as a moral monster. But, it may be asked, in the absence of such schools, where must we look for assistance and encouragement? In reply, the doctor boldly answers—to the institutions which are rising and thriving all around us. Through their agency, we may not be able to remedy the great defect of a National System of Education: we may not be able to instruct the child; but we may instruct the parent. We may lead that parent to a knowledge of the wonders and mercies of God's creation; we may simplify and unfold to him the treasures of learning; we may lead him to love the pure, the good, the beautiful, the useful in literature and science; and, we may depend upon it, the lesson will not be forgotten. The fire-side of the cottager will then be a witness to many a truth heard at our institutions, and the children of the cottager will learn from their parent to respect knowledge, to prize and pursue its blessings.

Becoming animated with the inspiration of his glorious subject, the lecturer exclaims—shew me a period in the history of our country, where there ever was as now such an universal, indomitable thirst for knowledge. If that cannot be shewn, all reasoning from the past is idle and gratuitous. It matters not what the timid may fear or the selfish prognosticate: the stream has burst with gushing, fearful power, from countless sources. It spreads and gathers strength. Will ye guide it into safe channels; or will ye, in lofty disdain and lonely magnificence, suffer it to waste the land? Will ye, as educated and influential men, take the lead in this outburst of intellect, or follow in the tracks of its desolation? It has come to this, join in the excitement or be left alone: unite religion with instruction: teach men to be loyal subjects, true christians, as well as free inquirers after truth. Let the duties and charities of life gather beauty from our Institutions; let each of these be a sacred spot of neutrality in a land of strife and turmoil, where all jealousies, all animosities may be hushed and banished, where friendships and kind offices between similar societies may be cultivated. Let all this be done courteously and effectually, and the result will prove every way advantageous to towns, and counties, and our common country.

Dr. Jones next engages in a lively description of the numerous and magnificent achievements already accomplished in Science and the Arts, by the exercise of enlightened intellect; and he ingeniously converts these into encouragements to hope that still grander discoveries will be completed in due time, and with adaptations even more beneficial to man, in the discipline of his faculties as a responsible being well assured of immortality. His consummating inquiry is—how far the Literary and Scientific Institutions are favourable to religion? In his opinion, formed from observation, and confirmed by experience, we may make them nests of infidelity or schools for the diffusion of genuine piety; but, with a fatherly

solicitude, he tenders this excellent advice to his hearers—be it your wise and noble choice to select the latter. What then, he inquires, is Religion? Is it a cold and abstract creed which demands our assent, for the sake of mere formality? Or, is it that which urges and hallows all our inquiries and our labours? It is a Revelation from God, himself the source of all knowledge. Whatever path we pursue, whether we stretch our thoughts to the material universe, or penetrate into the wondrous mechanism of our own physical constitution, or follow out the creations of mind, we trace equally the power and wisdom of the Creator. All rays of good converge to the same centre: all forms of mental and moral and religious improvement are substantially and ultimately one. When ignorance pervades and shadows a land, all this is designed to promote wise and gracious ends: on the other hand, when the torch of knowledge is lighted, it blazes at God's bidding, and is meant to accomplish the purposes of His divine will. As such, let us cherish and follow and revere it. Literature and Science are mere humble agencies, to perfect us in the love of truth and righteousness. It is manifest, from the experience of all ages, that there may be science, there may be eloquence, there may be talent and knowledge, without a single care or question as to man's immortality. In one word, there may be no religious wisdom. What is this wisdom? It is that which, studying and promoting the moral, mental and civil happiness of man here, forgets not that this state of being will pass away, and be succeeded by a state without end, eternal. What is Christianity? It is a Revelation from Heaven, to reconcile God to man, man to his fellow creatures, man to real happiness. Can that be opposed to mental energy? Can that be inimical to the pure expanding inquisitive ambition of an immortal mind? Can the heathenish infidel cherish in his cold withering, blighting dogmas, a higher nobler love of science and literature, an intenser and sincerer wish to spread their benedictions and their blessings, than he who goes forth "armed with the shield of faith and the helmet of salvation"? It is high time to disenchant the infidel of his insulting boast, that the friends to Religion are foes to Knowledge. It is high time to show and to prove, that Christianity is the Queen of Knowledge, the nursing mother of all that is lovely and great, of all that is good and useful.

We cordially and perfectly concur with Dr. Jones in his principles as exemplified in the preceding notes selected from his eloquent and instructive lecture; and we maintain, for a clear and consolatory induction fully demonstrated, that man is endowed by the Creator with an innate religious as well as intellectual nature, and that no System of Education can ever be extensively successful or permanently beneficial to society, that does not absolutely enjoin, as an eternal obligation, the co-equal and co-relative culture of man's religious and intellectual powers.

The Stomach in its Morbid States; being a Practical Inquiry into the Nature and Treatment of Diseases of that Organ, and into the influence they exercise upon the origin, progress, and termination of Diseases of the Liver, Heart, Lungs, and Brain; by Langston Parker, Member of the Royal College of Surgeons, and Fellow of the Royal Medical and Chirurgical Society of London; 8vo, Barlow, Birmingham, and Longman, London, 1838, pp. xx, 304.

Mr. PARKER's is a comprehensive and elaborate medical treatise; and consequently, it embraces subjects far above the sphere of a journal devoted to general science and literature. Since, however, his method is so distinct and his style so perspicuous as to be intelligible for the most part by unmedical readers, we may venture to place before the Profession a mere view of his arrangement, and before the Public such an illustration of his practical principles and their applications as will render their propriety and usefulness apparent to ordinary experience.

By the author's intention, his work is materially different from all those which have preceded it, on the same subject. It is neither occupied chiefly with the consideration of pathological changes, nor is it limited to one class of primary morbid states. To his mind, organic disease itself has never appeared so essential as its precursory conditions; for these, by their long continuance, tend ultimately to produce incurable affections, either in the organs where they are seated, or in remote parts by sympathy; and, on this account, he wishes to represent these conditions as requiring the greatest attention.

Mr. Parker refers the primary Morbid Conditions of the Stomach to three distinct classes: *first*, its congestive and inflammatory states; *second*, the affections of its sensibility, both organic and animal; and *third*, the disorders of its secretions. He gives a valuable preliminary analytical table, for the purpose of affording a condensed outline of his observations; and, in the selection of its elements, he has displayed much tact and judgment. Thus we conveniently find—that, under thirteen separate heads, he treats of as many propositions with remarkable clearness and force of demonstration. We would recommend the doctors, both the idle and the studious, to peruse this table as an exercise which may inspire them with a resolution to cultivate a more intimate acquaintance with Mr. Parker's gastropathy and his expedients for rescuing sufferers from the tortures of its inexorable dominion.

For the benefit of those persons in whom the stomach solicits attention, through the instrumentality of occasional or periodical excitement, we will now select some notes from Mr. Parker's very instructive and judicious remarks on the principal remedies employed in diseases of the digestive organs.

General bleeding in affections of the stomach, even of the inflam-

matory kind, he holds to be inadmissible, except perhaps in a very severe acute form of the disease, where a single bleeding might be employed at the commencement, previously to local depletions. On the contrary, local bleeding is one of the most efficacious remedies that can be employed in such cases: it should not precede the use of other means; but, when these seem to produce but little benefit, or a mere temporary amendment, then a moderate bleeding from the region of the stomach should be employed. This resource should be adopted when fulness of blood in the mucous coat of that organ is suspected: even in extreme emaciation from long continued illness, two or three or four leeches will sometimes alleviate symptoms which would resist every other application. In acute inflammation, leeches may be applied freely to the number of fifteen or twenty, at each time. When, however, inflammation of the stomach arises during the progress of an affection of the heart or liver, the depletion must be more guardedly used, because the constitution has already been enfeebled or rendered irritable. When there is confirmed chronic inflammation of the stomach, more advantage will be derived from the daily application of six or eight leeches, than from a larger bleeding. In such cases, the quantity of blood taken at one time, is of extreme importance. Unpleasant nervous symptoms often accompany inflammatory disorders of the stomach, and a slight inflammation sometimes produces a disturbance in which the nervous symptoms predominate: hence, local depletions, although of vast utility, should be applied with much caution; for, when large, they are frequently succeeded by an aggravation of the concomitant nervous feelings. Many forms of gastric inflammation are strictly periodical: in others, the disease's prominent features, as pain and distension of the stomach, heat of the skin, and quickened pulse, are only present after meals. It is during these accessions, that local bleedings should be employed: at these periods, it is more useful, both as a palliative and curative remedy, than when resorted to in the intervals of the paroxysms. We have seen invalids giving a lively description of the relief they had obtained from treating the parts over the stomach with applications of very hot water, mustard-poultices, warm plasters, and especially of cupping-glasses with or without bleeding.

Constipation is a prominent and distressing symptom in many forms of stomach-disease: in such cases, although aperients are required and prove of the greatest utility when properly selected, yet they often increase the patient's sufferings, when violent and not guarded with sedatives. Mr. Parker prefers those which consist of blue pill with aloes or rhubarb, combined with galbanum, the extracts of hops, lettuce or henbane, or the salts of morphia. He thinks calomel, with the compound aloëtic pill and a sedative, is useful in some cases; but the mercurial should rarely exceed one grain, for a dose. These remedies, accompanied with solutions of the neutral salts in bitter infusions with hydrocyanic acid, form the best aperients: they operate freely without pain or uneasiness, and generally afford very

marked relief. Occasional lavements are said to be good, by sparing the stomach the excitement of medicines.

Sedatives constitute an important class of remedies in affections of the mucous membrane of the stomach, because the parts then have their sensibility in a state of exaltation. It is from a knowledge of this circumstance, that Mr. P. never prescribes an aperient or other medicine, in gastric diseases, without combining it with muriate of morphia, hydrocyanic acid, or extract of henbane. When applied externally to the epigastric region, sedatives are often found of great service in promoting a cure, and in mitigating the pain of incurable cases. Mr. P. recommends, for this purpose, a piece of flannel soaked in a strong solution of opium and worn over the stomach: or, as more efficacious, a solution of three drachms of the extract of belladonna in seven ounces of water to be used as a tepid fomentation: or, a poultice of the leaves of this plant, or of henbane, hop or poppy. These applications prove highly serviceable in all diseases of the stomach attended with pain.

During digestion, the gastric juice contains free hydrochloric and acetic acids, in proportion to the stimulating qualities of the food. Many disorders of the stomach are accompanied with an excess of acid, in its secretions; and, in some instances, intense acidity forms one of the most prominent and distressing features of the complaint. In such cases, it becomes necessasy to administer remedies to neutralize this excess of acid, as well as to adopt others for preventing the disposition to its recurrence. Mr. Parker specifies the chalk-mixture, with large doses of hydroyanic acid, as being here particularly beneficial, especially when there also is intestinal irritation. At other times, he employs magnesia or soda combined with morphia, or the subnitrate of bismuth. When excessive acidity is connected with great bodily weakness and debility of the constitution, he exhibits the carbonate of iron with myrrh and rhubarb, as the most efficacious remedies.

Tonics require to be administered with discernment and caution in disturbances of the digestive organs; but, at the same time, medicines of this kind do much good in very many stomach affections. Mr. Parker divides these into four classes. *One*, the primitive morbid states of the stomach, resembling inflammation, which are aggravated by a lowering treatment, or by aperients. *Two*, the states of disease, succeeding to inflammation, which have been benefited by a lowering treatment at the commencement, but where this no longer affords relief, or adds severity to the symptoms. *Three*, the various morbid degrees of the sensibility of the stomach: these are occasionally accompanied by intermittent neuralgic affections in other parts of the body. *Four*, the states of general debility, and many local symptoms, as pain, sickness and vomiting, which attend confirmed organic diseases of the stomach. At the period when the complaint ceases to be inflammatory and passes into one of debility or of excessive sensi-

bility, then is the time when the lowering plan should be abandoned, and a course of tonics with a generous diet substituted.

Thus, have we endeavoured to *popularize* some of the practical precepts propounded in Mr. Parker's volume; but we have not engaged in this attempt, with any view to encourage their popular applications; we desired exclusively to shew that he has completed a sensible and instructive work, in all respects deserving to be highly appreciated and patronized by the medical profession.

The Principles of Gothic Ecclesiastical Architecture, elucidated by question and answer; by Matthew Holbeche Bloxam; the *third* edition, with one hundred graphic illustrations; 12mo, Combe, Leicester; Tilt, London; Parker, Oxford; 1838; pp. 130.

Mr. Bloxam's *Principles* are beautifully and faithfully elucidated by the combined effect of his figures and clear though concise descriptions. In his *Introduction*, he traces the Gothic or English Architecture from its origin in the age of our Celtic ancestors the first possessors of the British soil, through its varied progress, down to its decline at the reformation. This preliminary sketch abounds with observations well fitted to engage the attention of students and others whose peculiar taste inclines them to the investigation of historical and ecclesiastical archæology. It is admirably completed in his *concluding chapter* on the internal arrangement and decorations of a church: his closing statements constitute a very melancholy but instructive picture. "Our churches," he says, "were fated in 1643 to undergo no slight scenes of spoliation and desecration. By an order of the House of Commons, the churchwardens of every parish were required to take away and demolish every altar or table of stone within their respective churches, and to remove the Communion-table from the east end of the church, and place the same in some other part of the body of the church, the rails of the Communion-table having been previously ordered to be taken away, and the chancels levelled. Under colour of these ordinances," Mr. B. adds, "the beauty of the cathedrals and churches was injured to an extent hardly credible; the monuments of the dead were defaced in the iconoclastic fury which then raged; and the havoc made of church ornaments, and the destruction of the fine painted glass with which most church windows then abounded, may in some degree be estimated from the account given by the Parliamentary Commissioner for demolishing the superstitious pictures and ornaments of churches within the county of Suffolk, who kept a journal of the particulars of his transactions. This was not enough: our sacred edifices were polluted and profaned in the most irreverent and disgraceful manner; and, with the exception of the destruction which took place on the dissolution of the monastic establishments in the previous century, more devastation was occasioned at this time,

1643, by the party hostile to the Established Church, than had ever been committed since the ravages of the ancient Danish invaders;" and all this was perpetrated under the impulse of a spurious piety, which displayed its spirit in the destruction of property, the wealth and the strength of a nation!

There is great distinctness, both of method and detail, in Mr. Bloxam's exposition of his *principles*. He opens this with a definition of Gothic architecture, and then treats successively of its origin and different styles or orders, including an account of the several kinds of arches, with a specification of the principal and subordinate parts of a church. Seven distinct styles enter into his division of the Gothic architecture, and he defines "the periods in which they flourished." I. The *Saxon* prevailed from the mission of Augustine, at the close of the *sixth*, to the end of the *tenth* century. II. The *Norman* prevailed generally throughout the *eleventh* and *twelfth* centuries. III. The *Semi-Norman* or *Transition* prevailed from A. D. 1135 to the commencement of the *thirteenth* century. IV. The *Early English* was the prevailing style of the *thirteenth* century. V. The *Decorated English* was the general style of the *fourteenth* century. VI. The *Perpendicular English* prevailed during the *fifteenth* and early part of the *sixteenth* century. VII. The *Debased English* formed the usual style of the *sixteenth* and early part of the *seventeenth* century. The characteristic difference in these styles depends chiefly on the form of the arches, which are simicircular, pointed and mixed; the size of the windows, and the manner in which they are subdivided by transoms, mullions and tracery; and in certain ornaments and mouldings peculiar to each style, and which are seldom to be met with in any other.

Let this brief notice suffice to exhibit the scope and extent of Mr. Bloxam's undertaking. In its fulfilment, his object stands well intitled to the highest commendation. On the pages of his *Principles*, his architectural knowledge appears conspicuous, intimate and extensive. His pictorial illustrations deserve much praise for their beauty and usefulness. His book should have a place in the library of every clergyman and church-warden throughout the kingdom. Most of the laity ought to be acquainted with the *principles of Gothic ecclesiastical architecture:* were but one copy of this excellent little work deposited in every vestry, so as to be accessible to the parishioners, its possession would prove the powerful means of preventing churches from being disfigured by those detestable misrepairs, which bear eternal testimony against the illiberality of the Utilitarian Spirit, and its parsimonious bigotry.

Le Bijou Littéraire; ou Anecdotes Historiques, et Extraits Moraux des meilleurs prosateurs et poètes Français; par C. Victor Martin; 8vo. à Londres, 1837: pp. xvi, 300.

The author of this elegant little work, M. Martin, is already well known to us by his admirable Treatise on the French verbs, we were therefore predisposed in favour of *le Bijou Littéraire*, having in the "Treatise" had ample proof of the talent of the author.

This work of M. Martin, we can most warmly recommend, not only to the student in the French tongue, to whom it will offer a variety of subject and style not to be found in any other elementary work of its kind, but even to the proficient in the French language, *le Bijou Littéraire* presents much that is interesting and profitable. The subjects, though varied, are remarkable for their elegance, and display an admirable choice in their selection. Some of the latter pieces cannot be excelled, they are full of noble and sublime truths.

The Poetical Extracts are from the first French writers, both ancient and modern. We hope that every one will procure the *Bijou Littéraire*, as nothing tends to humanize the mind and break down national prejudices so much as the study of those enlarged ideas and sentiments of goodness and beauty for which the writings of great men in every nation are celebrated.

PROCEEDINGS OF SOCIETIES.

BIRMINGHAM LITERARY AND PLILOSOPHICAL INSTITUTION.

The present session of this Institution, commenced in November last, with a lecture by Mr. Corrie on Knowledge in connection with Civilization, a subject possessing great interest. Some valuable communications were made relative to Meteorolites, to the phenomena of the Aurora Borealis; and to Saurian remains, by Dr. O. Ward. Dr. Blakiston delivered a lecture on the Diffusion of Scientific Knowledge in large towns, which we are happy in being enabled to present to our readers, in the present number. The same gentleman is now engaged in giving a course of ten lectures on Chemistry, an abstract of which will probably appear in our journal. Mr. Ick the able and talented Curator of the Institution, intends resuming his illustrations of Botany in the spring.

Such Philosophical Institutions as this at Birmingham, merit the greatest encouragement; for, at the same time that they develope

and concentrate native talent, they afford to the community at small cost, the advantages arising from united scientific research. Unless the labours of science are appreciated and in some degree rewarded, they will necessarily cease to be so actively exerted. We could have wished to have seen the valuable museum of Mr. Weaver (lately on sale) in the possession of this Institution, and we cannot but congratulate the present proprietors of the Collection, on their spirit and liberality in securing a treasure so extensive and valuable.

Birmingham has greatly improved, of late years; and, from its central situation as regards the great lines of communication through the country, it will probably, ere long, rank as the second capital of the kingdom. As it still further increases in mercantile prosperity, we hope that all useful learning will become widely diffused through its population. Indeed, there can be no doubt but this will be the happy result. Society generally is proceeding every day to acknowledge more and more the necessity of cultivating the intellectual faculties, rather than the mere propensity to acquire gain and enjoy pleasure, or the indulgence of the lowest feelings. The shades of Ignorance are fast dispersing before the torch of enlightened Reason; but we would ever maintain, that this torch should burn with a pure flame, and be held with a steady hand, not cast loose as a fire-brand which may dazzle or blind rather than illuminate. Knowledge may give power, but the possession of power alone does not necessarily ensure happiness. The true philanthropist, in giving the one, will endeavour by the best means in his power to promote the principles by which the other shall be disseminated.

WOLVERHAMPTON LITERARY AND SCIENTIFIC SOCIETY.

This Society has been established about two years, and it already includes amongst its members many of the most talented men of the town and neighbourhood. Since September last, the following papers have been read before the institution. On the progress and tendency of Philosophy, by Mr. Kettle. On Meteorology, or the phenomena of the earth's atmosphere, by the Rev. S. Hunter. On the organic remains of the Lias, and also on the Invertebrated Animals as an introduction to the study of Conchology by Mr. Jukes. On situation, habits and social employments as affecting health and longevity by Dr. Bell. On the different gases of the atmosphere, by M. de Londe. On the learning and science of Ancient Nations, by the Rev. Dr. Oliver, and on Phrenology by Mr. Coleman. Many of these communications possessed great merit, and led to both agreeable and instructive discussions. It is the anxious wish of the members of this Society, to establish a Museum and Library, and we trust they will meet with such support as may enable them to carry their laudable design into effect, so as to perpetuate the existence and the influence of their institution.

LEICESTER LITERARY AND PHILOSOPHICAL INSTITUTION.

At a recent meeting of this Institution, Mr. Berry read a paper on the manners of the Romans, in which he gave a general view of the habits of this extraordinary people, during different epochs of their history; and he described with great ability and power, the occupations of a day in the Augustine age. Dr. Shaw made a communication on Statistics; and we understand he intends to treat at some length on this intricate subject, particularly in its local and vital branches.

At an early meeting of the Institution, a paper will be read on the Icelandic *Voluspa*, which comprises the ancient system of Scandinavian Mythology, and constitutes part of the celebrated Edda, or Runic Philosophy compiled by Sæmund, surnamed the *learned*, about the middle of the eleventh century.

MISCELLANEOUS COMMUNICATIONS.

Electrical Society.—At a late meeting of this Society, Mr. Crosse read a paper giving an account of his electrical experiments, in which a certain insect made its unexpected appearance. He trusted that the members would not imagine that because he had delayed so long furnishing them with the account, such delay had been occasioned by any desire of withholding what he had to state, from the society in particular, or the public at large. He was delighted to find that at last, late, though not less called for, an institution had been formed for the purpose of explaining and making public those mysteries which hitherto, under a variety of names, and ascribed to all causes but the true one, have eluded the grasp of men of research, and served to perplex, perhaps, rather than to afford sufficient data to theorise upon. Much has been done in the course of a few years, and this affords the strongest reason for believing that vastly more remains to be done. Electricity is no longer the confined science it was supposed to be, making its appearance only from the friction of glass or wax, employed in childish purposes, serving as a trick for the school-boy or a nostrum for the quack; but it is even now, though in its infancy, proved to be most intimately connected with all operations in chemistry, with magnetism, with light and caloric, apparently a property belonging to all matter, perhaps ranging thro' space, from sun to sun, from planet to planet, and not improbably the secondary cause of every change in the animal, the vegetable, the mineral, and the gaseous systems. To determine these probabilities, as far as human faculties can determine, and to find out to what useful purposes electricity might be applied, Mr. Crosse conceived to be the object of the Electrical

Society, and he should at all times be ready and willing, as a member, to contribute his quota of information to its support.

In a former report of the proceedings of the Electrical Society of a translation of a paper read before the Academie des Sciences at Paris, describing "Mr. Crosse's insect," and commenting upon "its creation," it was stated that Mr. Crosse had never manifested the slightest approach to the blasphemous arrogance of the creative power, and a hope was expressed to see ere long a full account from Mr. Crosse, calculated to remove such impressions, and place his wonderful experiments in their proper light. The truth of this assertion is confirmed and their hopes realised by the present full and explicit account; but let Mr. Crosse speak to his justification in his own words:—"It is most unpleasing to my feelings to glance at myself as an individual, but I have met with so much virulence and abuse—so much calumny and misrepresentation, in consequence of the experiments which I am about to detail, and which it seems in this nineteenth century a crime to have made—that I must state, not for the sake of myself (for I utterly scorn all such misrepresentations), but for the sake of truth and the science which I follow that I am neither an 'Athiest' nor a 'Materialist,' nor a 'self-imagined creator,' but a humble and lowly reverencer of that Great Being whose laws my accusers seem wholly to have lost sight of. More than this, it is my conviction that science is only valuable as means to a greater end. I attach no particular value to any experiment that I have made: my feelings and habits are much more of a retiring than an obtruding character, and I care not if what I have done be entirely overthrown, if truth be elicited." The true investigator of science, the persevering seeker for truth, and the unassuming relater of the results of a series of experiments for the advancement of science only, stand forth in the following plain and minute accounts of the experiments in question. In endeavouring to form artificial minerals by a long-continued electric action on fluids, holding in solution such substances as were necessary for the purpose, every variety of contrivance had been employed by Mr. Crosse which might enable him to keep up a never-failing electrical current of greater or less intensity, or quantity, or both, as the case required, and which expose the solutions used to the electric action, in the manner best calculated to effect the object in view. Amongst other contrivances, a wooden frame was constructed of about two feet in height, consisting of four legs proceeding from a shelve at the bottom, supporting another at the top, and containing a third in the middle, each of these shelves about seven inches square. The upper one was pierced with an aperture, in which was fixed a funnel of Wedgwood ware; within this rested a quart bason on a circular piece of mahogany placed within the funnel. When this bason was filled with a fluid a strip of flannel wetted with the same was suspended over the edge of the bason and inside the funnel, and, acting as a syphon, conveyed the fluid out of the bason through the funnel in successive drops. The middle shelf of the frame was likewise pierced with an aperture, in which was fixed a smaller funnel of glass, supporting a piece of somewhat porous red oxide of iron, from Vesuvius, immediately under the dropping of the upper funnel. This stone was kept constantly electrified by means of two platina wires on either side of it, connected with the poles of a voltaic battery of nineteen pairs of five inch zinc and copper single plates, in two porcelain troughs, the cells of which were

filled at first with water, and 1-500th of hydrochloric acid, but afterwards with water alone. (In all the subsequent experiments relative to these insects the cells of the batteries employed were filled with nothing but common water.) The lower shelf merely supported a wide-mouthed bottle, to receive the drops as they fell from the second funnel, to be poured back again into the basin above, without disturbing the position of the stone. The volcanic substance was selected by mere chance, in consequence of its partial porosity, and Mr. Crosse did not believe it had the slightest effect in the production of the insects. The fluid with which the bason was filled was made as follows:—A piece of black flint having been exposed to a red heat, and quenched in water, to make it friable, was reduced to powder, two ounces of which were intimately mixed with six ounces of carbonate of potassa, and the compound was exposed to a strong heat for fifteen minutes in a black lead crucible, in an air furnace. In this fused state it was poured on an iron plate, reduced to powder, whilst still warm, and boiling water poured upon it; it was, then kept boiling for some minutes in a sand bath. The greater part of the soluble glass thus formed was taken up by the water, together with a portion of alumina from the crucible (a silver one would have been used, but Mr. Crosse had none sufficiently large). To a portion of the silicate of potassa thus formed boiling water was added, to dilute it, and then slowly to supersaturation, hydrochloric acid. This fluid was subjected to a long-continued electric action, through the intervention of a porous stone, in order that, if possible, crystals of silica might be formed at one of the poles of the battery; but Mr. Crosse failed in accomplishing this by these means. On the fourteenth morning from the commencement of the experiment, were observed, through a lens, a few small whitish excrescences or nipples, projecting from about the middle of the electrified stone, and nearly under the dropping of the fluid above. On the 18th day these projections were enlarged, and seven or eight filaments, each of them larger than the excrescence from which it grew, made their appearance on each of the nipples. On the 22d day these appearances were more elevated and distinct; and on the 26th day each figure assumed the form of a perfect insect, standing erect on a few bristles which formed its tail. Until this period, Mr. Crosse had had no notion that these appearances were any other than an incipient mineral formation; but it was not until the 28th day, when he plainly perceived the little creatures move their legs, that he felt any surprise; and when this occurred, as may be easily imagined, he was not a little astonished. Mr. Cross endeavoured to detach, with the point of a needle, one or two of them from their position on the stone; but they immediately died, and he was obliged to wait patiently a few days longer, when they separated themselves from the stone and moved about at pleasure, although they had been for some time after their birth apparently averse to motion. In the course of a few weeks, about a hundred of them made their appearance on the stone. At first, each of them fixed itself, for a considerable time, in one spot, appearing to feed by suction; but, when a ray of light from the sun was directed upon it, it seemed disturbed, and removed itself to the shaded part of the stone. Out of about a hundred insects not above five or six were born on the south side of the stone. On being examined with a microscope, the smaller ones appeared to have only six legs, but the larger ones eight.

Mr. Crosse states that "it would be superfluous to attempt a description

of these insects, when so able a one has been transmitted from Paris. It seems they are of the genus acarus, but of a species not hitherto observed." They have been seen and examined by many scientific men and eminent physiologists, who all coincide with M. Turpin and the members of the Academie des Sciences as to their genus and species. Mr. Crosse has never ventured an opinion as to the cause of their birth. He conjectured that they arose from ova deposited by insects floating in the air, and that they might possibly be hatched by the electric action; but he could not imagine that an ovum could shoot out filaments, and that these filaments would become bristles; and he could not, on the closest examination, detect any remains of a shell. Moreover, we have no right to assume that electric action is necessary to vitality, until such fact shall have been most distinctly proved. Mr. Crosse next imagined their origin from the water, and closely examined several hundred vessels in the same room, filled with the same water as that which held in solution the silicate of potassa, but could perceive no trace of an insect of that description. He then examined the crevices and dusty parts of the room, with no better success. In the course of some months, these insects so increased that, when they were strong enough to leave their moistened birth-place, they issued out in different directions; Mr. Crosse supposed in quest of food; but they generally huddled together under a card or piece of paper in their neighbourhood, as if to avoid light or disturbance.

In the course of experiments upon other matters a glass basin was filled with a concentrated solution of silicate of potassa without acid, in the middle of which was placed a piece of brick, consisting chiefly of silica, connected at each end with the poles of a voltaic battery of sixty-three pairs of plates, each about two inches square. After many months' action, silica in a gelatinous state formed on the bottom of the brick, and as the solution evaporated it was replaced by additions, so that the outside of the glass basin being constantly wet by repeated overflowings was of course constantly electrified. On this outside, as well as on the edge of the fluid within, the insects were similarly produced. The apparatus was covered with them, they hid themselves wherever they could find shelter, many were plainly perceptible to the naked eye as they nimbly crawled from one spot to another. On examining the table with a lens, no such excrescence as that which marks their incipient state could be perceived. Other experiments were also in progress at this time with different-sized batteries. On a clay slate suspended in a glass cylinder by two platina wires, in a similar solution to the foregoing, similar excrescences and growth to perfect insects were observed. Between the poles of one battery were interposed a series of seven glass cylinders, filled with the following concentrated solutions:—1, Nitrate of copper; 2, subcarbonate of potassa; 3, sulphate of copper; 4, green sulphate of iron; 5, sulphate of zinc; 6, water acidified with a minute portion of hydrochloric acid; 7, water poured on powdered metallic arsenic, resting on a copper cup connected with the positive pole of the battery. All these cylinders were electrically united together by arcs of sheet copper, so that the same electric current passed through the whole of them. After many months' action, and consequent formation of certain crystalline matters, similar excrescences appeared at the edge of the fluid in every one of the cylinders excepting the two which contained the carbonate of potassa and the metallic arsenic, and in

due time a host of insects made their appearance. In another experiment, a bent iron wire, one-fifth of an inch in diameter, in the form of an inverted syphon, was plunged some inches into a concentrated solution of silicate of potassa, and connected with the positive pole, whilst a small coil of fine silver wire joined it with the negative. Similar insects were formed on the gelatinous silica on both wires, also on that part of the wires free from the siliceous deposits, about half an inch below the surface of the fluid. Some of them were formed on the inverted part of the syphon-shaped wire, yet they did repeatedly contrive to arrive at the surface, and to extricate themselves from the fluid. The room in which the three last batteries were acting was kept almost constantly darkened.

Other experiments were described. The concluding remarks were to the following purport:—Mr. Crosse had not observed a formation of the insect excepting on a moist and electrified surface, or under an electrified fluid. By this he did not mean to assert that electricity had anything to do with their birth, as he had not made a sufficient number of experiments to prove or disprove it. These insects do not appear to have originated from others similar to themselves. He believed they live for many weeks; occasionally he had found them dead in groups, apparently from want of food. It had often been suggested to him to repeat the experiment without the electric agency; but this he considered would be by no means satisfactory, let the event be what it may. It is well-known that saline matters are easily chrystallised without being subjected to the electric action; but it by no means follows that, because artificial electricity is not applied, such chrystals are formed without the electric influence. Mr. Crosse has made so many experiments on electrical chrystalization, that he is firmly persuaded that electric attraction is the cause of the formation of every chrystal, whether artificial electricity be applied or not. He states, however, that he is well aware of the difficulty of getting at the truth of these matters, and of separating cause and effect. With regard to the productions of insects in paste, vinegar, &c., and after blight in fruit trees, he observes—does not a chemical change take place in the former, as also in the sap of the tree, previous to the appearance of the insects, and is or is not every chemical change produced by electric agency? In making these observations he sought to mislead no one. The book of Nature is opened wide to our view by the Almighty power, and we must endeavour, as far as our feeble faculties will permit, to make a good use of it, always remembering that, however the timid may shrink from investigation, the more completely the secrets of Nature are laid bare, the more effectually will the power of that Great Being be manifested who seems to have ordained that "order is Heaven's first law."

Punishment of Death.—Mr. Livingston, the illustrious American legislator, on being empowered by the House of Representatives of the State of Louisiana to prepare a Penal Code, in his Report to the Legislative Assembly, thus speaks of the punishment of death:—I approached the inquiry into the nature and effect of this punishment with the awe becoming a man who felt most deeply his liability to err, and the necessity of forming a correct opinion on a point so interesting to the justice of the country—the life of its citizens and the character of its laws. I strove to clear my understanding from all prejudices which education or early impressions might have created, and to produce a frame of mind fitted for the investigation of truth,

and the impartial examination of the arguments on this great question After the best use that my faculties would enable me to make of all the sources of knowledge on this subject within my reach, after long reflection, and not until I had canvassed every argument that could suggest itself to my mind, I came to the conclusion that *the punishment of death should find no place in the code* which you have directed me to present.

In coming to a resolution on this solemn subject, we must not forget a principle established on the soundest reason—that, other things being equal, the punishment should be preferred which gives us the means of correcting any false judgment to which passion, indifference, false testimony, or deceiving appearances may have given rise. Error, from these or other causes, is sometimes inevitable. Its operation is instantaneous, and its fatal effects in the punishment of death follow without delay: but time is required for its correction. We retrace our steps with difficulty. It is mortifying to acknowledge that we have been unjust; and, during the time requisite for the discovery of the truth, for its operation on our unwilling minds, for the interposition of that power which alone can stop the execution of the law, its stroke falls, and the innocent victim dies. What would not then the jurors who convicted, the judges who condemned, the mistaken witness who testified to the guilt, what would not the whole community who saw the sufferer's dying agonies, who heard at that moment his fruitless asseverations of innocence, what would they not all give to have yet within their reach the means of repairing the wrongs they had witnessed or inflicted?

Instances of this kind are not unfrequent: many of them are on record. *Several have taken place in our own day; and a very remarkable example, which was given but a few years since in one of the Northern States, shows, in a striking manner, the danger of those punishments which cannot be recalled or compensated, even though the innocence of the sufferer is rendered clear to demonstration.* A few such instances in a century are sufficient to counteract the best effects that could be derived from example. There is no spectacle that takes such hold on the feelings, as that of an innocent man suffering by an unjust sentence. One such example is remembered, when twenty of merited punishment are forgotten. The best passions take part against the laws, and arraign their operation as iniquitous and inhuman.

To see a human being in the full enjoyment of all the faculties of his mind and all the energies of his body—his vital powers attacked by no disease, injured by no accident—the pulse beating high with youth and health—to see him doomed by the cool calculation of his fellow-men to certain destruction, which no courage can repel, no art or persuasion avert—to see a mortal distribute the most awful dispensations of the Deity, usurp his attributes, and fix by his own decree an inevitable limit to that existence which almighty power alone can give, and which its sentence alone should destroy, must give rise to solemn reflections, which the imposing spectacle of a human sacrifice naturally produces, until its frequent recurrence renders the mind insensible to the impression.

On the Yellow Colour of the Leaves in Autumn.—It is well known that the green foliage of trees assumes before falling in Autumn, especially after one or more nights of frost, a beautiful citron-yellow colour. This is particularly observed in the Beech, (*Betula alba*), the Pear tree, (*Pyrus communis*), the Apple tree, (*Pyrus Malus*), the Elm, (*Ulmus campes-*

tris), the Ash, *(Fraxinus excelsior)*, and others. The foliage of the Alder, on the contrary, rarely becomes yellow but falls green. That of the Oak becomes not yellow but brown. The yellow foliage afterwards assumes the same brown colour when it is dried after its fall. Various researches have already been made on the yellow colour of the foliage. Macaire Prinsep communicated the result of several experiments on the autumnal coloration of the foliage; and the general conclusion is, that the foliage in Autumn ceases to evolve oxygen, but that it takes this gas from the air, that there is then formed an acid which tinges the foliage at first yellow, then red, and that this acid may be neutralized by an alkali, so that the foliage recovers its yellow colour. Like Clamor Marquart, he regards these colorations as modifications of one and the same colouring matter, which he terms *chromule*; and he says that it is the cause of the ordinary yellow or red colour of the petals. These results, Berzelius represents to be quite incorrect. Foliage once tinged yellow never becomes green under any re-agent; but foliage which has become red resumes a green colour on the addition of potass, because its red colouring matter forms green combinations with its alkali. Leopold Gmelin first directed attention to the difficulty with which the experiments of Macaire Prinsep could lead to precise results. Guided by this observation, Berzelius undertook some researches on the colour of the foliage altered by the agency of the autumnal cold. These he performed chiefly on the citron-yellow foliage of the common Pear tree *(Pyrus communis)* which was put recently and at the moment at which it was collected in a bottle, and completely covered with alcohol of 0.833, with which it was left in contact for forty days. The alcohol acquired a yellow colour; but the foliage was still yellow, though paler than before. The alcohol was decanted and the flask was kept for some time inverted. The foliage then acquired a brown colour, wherever it was in contact with the air, while the sides of the leaves which were in contact with the walls of the vessel, retained their yellow tint. Alcohol was poured at several intervals on the leaves, and each time was coloured yellow. At length the alcohol was made to boil, when it acquired a colour a little yellowish, but it became gelatinous during cooling.

The cause of this gelatinous state is the presence of a fatty matter, peculiar probably to the foliage examined which is obtained colourless after washing with cold alcohol, from new solutions and renewed washings. It possesses the following properties. In the dry state it is of a milky white, its fragments similar to chalk. It becomes soft under pressure; it is inodorous and tasteless. It melts at 73°, and becomes concrete and turbid on cooling. Insoluble in water, it requires 425 parts of cold alcohol to dissolve it. A saturated solution at boiling heat is converted, on cooling, into a transparent jelly like paste. Cold ether dissolves little of it, but more than alcohol. It is insoluble in caustic potass. It passes without change to the dry distillation, if, during the process, air be excluded. The leaves macerated as now described, were now distilled to one-eighth; and there was then deposited on cooling, a granular substance, which presented a species of crystallization. After the separation of this substance, the distillation was continued till nothing was left but the water of the vegetation of the leaves. On this yellow brown liquor was then floating a yellow soft fatty substance, with an appearance identical to that of the grains containing the yellow colouring matter of the foliage. These grains presented to the microscope no trace of

crystallization, and they might be drawn by the fingers into a yellow unctuous fat. This is mixed with a small quantity of fat oil which Berzelius could distinguish but not isolate with certainty, and with another substance equally as fat. It could be detached in greater degree from the first substance, by digestion with a weak solution of caustic potass, which saponifies the oil and dissolves only a small quantity of the yellow fat. The yellowish fat acids are precipitated from the alkaline solution by hydrochloric acid, and by redissolving them in very much diluted caustic ammonia (five or six drops of the *aqua ammoniæ* to one ounce of water) and again precipitating them, they are obtained colourless. To deprive it of the last substance, or the solid fatty matter, it is necessary to treat it with cold alcohol, in which it is not soluble. He was, however, never able to obtain it completely free from these two fat substances.

The yellow fat is soluble in alcohol, though in small quantity. In this solution it is not sensibly whitened at the same time as it begins to whiten with water. The alcoholic solution furnishes a precipitate on the addition of water; it then assumes a pale, milky-yellow aspect, with difficulty becomes clear, and also preserves this state after the evaporation of the alcohol. From the alcoholic solution it is deposited by spontaneous evaporation, under the form of a granular crystaline mass. It is copiously dissolved by ether, and it remains, after the evaporation of the solvent, transparent and of a yellow colour. In contact with concentrated sulphuric acid, it becomes brown, is sparingly dissolved, but with alteration, and furnishes then a brown-yellow liquor, which is precipitated by water in a white gray. In caustic potass it is very sparingly dissolved, and exposed in this solution for some time to the influence of air and light, it is bleached. From the solution in potass it is precipitated by acids in pale yellow flakes, which, if properly washed, do not redden turnsol infusion. In carbonate of potass it is little or not at all soluble, and insoluble in caustic ammonia, to which, nevertheless, it imparts a yellow colour.

This yellow colouring matter is therefore a peculiar fatty substance, intermediate between the fat oils and the resins, which may be bleached, retaining, however, its property of being with difficulty soluble in alcohol, and of being fat and unctuous. To this Berzelius proposes to apply the epithet of *Xanthophylle* from ξανθος, yellow, and φυλλον, leaf or foliage. He thinks there is every reason to presume that in the disappearance of the green colour and its conversion into yellow, the latter arises from the green by virtue of a change in the organization of the leaf effected by cold, and which modifies the organic process. He has in vain, however, attempted to reproduce the green colour with the yellow; and he has been equally unsuccessful in converting the green into yellow.

The brown colour of the foliage presents no common character with the yellow. It is produced by an extractive principle, at first colourless, which, after the disorganization of the epidermis of the foliage, becomes brown by the action of oxygen, and then communicates to the fibre of the skeleton of the foliage a brown tint, which cannot be removed even by digesting it with a weak solution of caustic potass, and cannot be destroyed by long continued treatment with sulphuretted hydrogen.—Berzelius, *Annalen der Pharmacie*, vol. xxi, st. 3, p. 257.

On the Red Colouring of Fruits.—The red colouring matter of several kinds of fruits has in general been regarded as a blue colour, reddened by an acid. This may be the case as to the colour of several fruits; but all are not in the same predicament; and consequently the colouring matter of those which form the exception ought to be determined separately. Berzelius examined the colour of the Cherry (*Prunus cerasus*) and of the black Currant (*Ribes nigrum*), and found both to contain the same colouring matter, and the latter to be not blue. This presumption, perhaps, proceeds from the fact, that the juice of these fruits gives, with acetate of lead, a blue precipitate. These precipitates, however, are malate and citrate of lead, with which the colouring matter is combined, and the latter may be withdrawn from it, still slightly mixed with free acid, by a soluble quantity of sulphuretted hydrogen; and, after the separation of the acids, it is as to be now described.

To obtain it pure, it is requisite to separate the acids completely; and the best agent for this purpose is chalk in fine powder, which causes a deposit of malate and citrate of lime. Small quantities of lime are then added, in order to precipitate the neutral malate of lime contained in the liquor, which is next filtered and mixed with a little acetate of lead, when the green blue then formed is separated, because it contains, perhaps, also malate of lead, and whatever is in solution in the liquor is precipitated by acetate of lead.

The green precipitate is collected on a filter, and washed in such a manner that it may be always covered with water to prevent the access of air. It is then decomposed by sulphuretted hydrogen; the filtered liquor is evaporated *in vacuo* over sulphuric acid; the colouring matter left is dissolved in anhydrous alcohol, while the latter leaves undissolved the colouring matter altered by the air, and pectine or pectic acid. By distilling the alcohol and desiccating the residium *in vacuo*, the colouring matter is obtained in the form of a beautiful red transparent brilliant mass.

Much loss is sustained in determining at first, in the juice of these fruits, by the aid of acetate of lead, the presence of a blue precipitate of malate and citrate of lead, then precipitating the colouring matter and the filtered liquor by the subacetate of lead, and decomposing the washed precipitate by sulphuretted hydrogen. In this state the colouring matter is soluble in all proportions in water and in alcohol, but insoluble in ether. After evaporation of its solution in the sand-bath it remains aqueous; but there is formed a deposit less soluble in water, and very little soluble in alcohol, viz., another red colouring matter less alterable. If to a solution of the colouring matter in water there be added a little milk of lime, a gray green combination is precipitated. The colouring matter not yet precipitated is red, but of another shade, because it contains a combination of lime with excess of colouring matter. If the natural colour of the latter were blue, its solution would be blue, and not red, because then every free foreign acid is saturated. The colouring matter, on the contrary, forms, as has been seen, a combination with the malate and the citrate of lead, and the latter is of a beautiful blue colour; but this colour presents nothing of the particular shade of the colouring matter. The solution of the latter may be preserved without being oxidated; nor is it oxidated so long as it remains in contact with the free acid in the juice of fruits. The brown red deposit is feebly soluble in water, to

which it imparts a deep red colour; while potass dissolves it with a deep brown colour. It forms, with ammonia, a neutral soluble combination, and another acid, insoluble or sparingly soluble, coloured red brown. The green neutral combinations of the pure red colouring matter are changed in the moist state, at the expense of the air, into this brown combination. The precipitate of lead, however, constitutes an exception, since it is preserved during washing and desiccation.

Berzelius adds, that he has preserved for sixteen years, without change, the green precipitate obtained from the fruits of the Mountain Ash (*Sorbus aucuparia*), by the subacetate of lead, after having previously separated the malic acid by means of carbonate of lead.—BERZELIUS, *Opere citato.*

ON THE RED COLOURING MATTER OF THE LEAVES IN AUTUMN.—The foliage of certain leaves is observed in autumn to become red. All the trees and shrubs on which Berzelius observed red leaves, bear also red coloured fruits; for instance, the Mountain Ash (*Sorbus aucuparia*), Cherry (*Prunus cerasus*), Gooseberry (*Ribes grossularia*), var. *rubra*, the Barberry (*Berberis vulgaris*), and the like. The red colour contained in these leaves is so near to the preceding that it may be pronounced identical. Berzelius, nevertheless, examined only the red colour of the foliage of the Cherry tree, and especially the red Gooseberry, the leaves of the last of which often become so red that they have completely the aspect of ripe fruits. Their colouring matter was extracted by alcohol, which, after distillation, left a red liquor, which was separated by filtering from a resin, and a fatty substance precipitated. The filtered liquor was mixed with water, which was effected without turbidity, and then with neutral acetate of lead, in which there was formed a precipitate of a beautiful grass green, which, at the end of some seconds, assumed a gray brown colour; and acetate of lead was then added until the precipitate no longer changed, and that last obtained preserved its green colour. It was then separated by the filter, and what was left on the latter is a combination of oxide of lead with the vegetable acids of the leaves, and with a brownish colouring matter which is formed at the expense of the air into red solutions, alcoholic and aqueous. The residual colouring matter was precipitated with a beautiful grass green colour by means of acetate of lead, collected in a filter well washed, decomposed by sulphuretted hydrogen, and evaporated *in vacuo* to dryness. The solution precipitated by acetate of lead still furnished a small quantity of green yellow precipitate, when free acetic acid had been there saturated by subacetate of lead. From this precipitate was obtained a colouring matter entirely similar to the preceding. This colouring matter, to which Berzelius gives the name of *erythrophylle*, from ἐρυθρος, red, and φυλλον, a leaf, were it only probably that of the fruits while it is demonstrated to be so, is in aspect and chemical proportions similar to that of the Cherry and black Currant, and differs from them only slightly in the shade of colour, which is a deeper red and inclines more to the blood red, and in the property which it possess of forming green in yellow combinations, while those of the colouring matter of the Cherry and Grape are green or blue. The deposit formed by the evaporation of its solutions is of a clearer brown red than that of the preceding, and gives with the bases clearer brown red combinations, which do not so readily assume in the air a deep shade, than that of the fruits. But whether these shades belong to the deposit of the colouring matter in the leaves, or are peculiar to the colour-

ing matter of the red Gooseberries which Berzelius did not examine, he knows not. The red colouring matter of the leaves, half precipitated by limewater, gives a green precipitate, while the liquor acquires a paler red tint. Thus this colouring matter can no longer be regarded as originally blue.—Berzelius, *Opere Citato.*

Observations on the Formation of Shells.—Mr. Gray whose papers in the Philosophical Transactions are well known, lately delivered a valuable Lecture on the Growth and Structure of Shells, at the Royal Institution. He explained how Shell is secreted by a portion of the skin of the animal termed the mantel, at the edge of which, termed the collar, the process usually goes on with the greatest vigour. The simplest form of shell known to us, is that of a more or less flattened cone, as exemplified in the common limpet, and all other varieties of form may be shown to be modifications of this type; the whole structure of shells being caused by the animal's growing most to one side, and thus turning round a spiral axis. Shells are subject to periods of unusual increase, at which times strong bands or ribs are secreted, which add materially to their strength; the causes of this phenomenon are however unknown. In many shells we find large spines; these at one time corresponded to certain processes of the body of the animal. But when a shell continues to increase in size, and to turn round its axis, these spines might form a serious obstacle to its further growth. To provide, then, against this inconvenience, nature has bestowed on the animal a power of removing such spines as may be in its way. Mr. Gray did not explain how this is effected, we presume he means by some process of absorption, but we may remark, that the question as to the mode of this removal, is not yet set at rest by naturalists. At different periods of their growth, some shells vary so much in their appearance, that naturalists generally, even including Lamarck, have believed that the animals had the power of casting their shells, like many of the crustacea. This opinion has, however, been satisfactorily disproved: and the great change in their appearance is caused by the animal's turning back the alæ of its mantel over the edges of the shell, and secreting a fresh layer of shell, as in the case of the cowries. The beautiful variety of colours in shells is produced by a number of glands which secrete colouring matter, and are usually seated around the neck of the mantel. If these glands secrete constantly, then the shell is marked by coloured bands, but if they do so only at times, spots are produced; and thus every variety of colouring and marking may be explained. When the minute structure of shells is examined, it is found that the materials are in many cases not deposited in parallel layers, but in a method which greatly increases their mechanical strength, and which has been applied to the timbering of ships. Some shells are provided with an external membrane, which may be considered as analogous to the periosteum of bone, and has been termed the periostracum while others are devoid of it. The animals inhabiting shells are very generally provided with a flat round layer of bone situated on the inferior surface of their bodies, with which they close the aperture of their shells, when their bodies have been retracted within. These have been termed opercula. Mr. Gray concluded by alluding hastily to the structure of the bivalves, whose shells are constructed on the same plan as those of the univalves; and by explaining the beautiful provision in their hinges, by means of which the two valves are kept open by ligamentous bands when

the animal is in its natural situation with its body exposed to the waters of the ocean, while by means of a mouth it is enabled to counteract the natural action of the ligaments, and to close its shell at pleasure.

DIRECTIONS FOR PEDESTRIAN TRAVELLERS.—Colonel Shaw offers these Directions for Pedestrian Travellers in general, but we would recommend them in an especial manner to the attention of Naturalists whose pursuits necessarily expose them to the inconveniencies of pedestrian travelling. The benevolent Colonel begins with the remark, that if any one intends to make a long tour on foot, it is necessary to take some precautions. I need not say that English shoes are the best. I do not mean new shoes, but those of which the upper leathers are good and soft, and have been worn to fit the shape of the foot. To such a pair of shoes let an additional sole be put with small nails at the toes and sides; care being taken that the heel be not either too high or heavy. Let them be laced a short way up the instep, and of a size to allow the foot to sit easy without being loose, when a woollen stocking is on: of these strong shoes have two pair, and a third pair, not of such strong material, to be worn when you come to the end of your journey. As to the stockings, the greatest care must be taken in the choice, as such as are generally sold in shops are sure to cause blisters both at heel and toe. If you examine the ordinary qualities of stockings in shops, you will find that the threads are drawn together to a point in the middle of the heel, and about the ball of the big toe. Avoid such stockings as they are sure to cause misery. The stockings made by old women on wires are the best, and the finer the wool the better. Of these there should be four pairs; and if a stocking be put over each shoe (the outside innermost) they will not take much room, and will at the same time prevent the shoes from soiling the other things in the knapsack. As to other requisites, the first to be provided is a good knapsack of the best oil-skin. It is to be had in all the military store shops in London. Care should be taken to have the straps of the best patent leather, and a degree broader than usual. The proper breadth for ease is the regulation strap for the Guards' knapsack. They should be so lon that you can use them in the foreign manner if you choose. By this I mean that in the foreign knapsack the fixture from which the shoulder straps play, is placed in the centre of the knapsack, while the English fixtures are placed on the points of the shoulders just in a line with the shoulder straps, so that the whole weight of the knapsack is on the upper part of the arms, instead of being divided over the back. In the French manner the knapsack sticks closer to the back, consequently you do not feel its weight so oppressive. When provided with a knapsack, get a wide cloak, (so wide as to go over the knapsack) of the very finest silk oils-kin, long enough to reach to the middle of the thigh; likewise an oil-skin to the hat. Caps are recommended, but a hat is preferable, as you can carry things in the hollow of it. For a coat nothing is so good as a surtout made of the finest cloth; it should button up close to the neck to avoid cold, the oil-skin cloak can be used either for sitting or laying on the ground. Have two pairs of trowsers of dark gambroon. As it is of consequence to walk cool, if possible, march without drawers, but be sure to put them on at the end of the journey; one pair is enough; they can be washed and dried while you are in bed. As to shirts, have one in the knapsack, and a very long night shirt made of the finest and lightest cotton, which will be found of the greatest benefit when you are

not sure of the cleanliness of the bed. If your trowsers are wide, you can even wear it at the end of a day's journey. Of course a fresh flannel under-vest must always be in the knapsack. The best gaiters to wear, are those used by the French when shooting. They are made of the strongest soft leather, with straps to tighten if necessary. They should be as high as the knee, and buckled over the trowsers, so that however dirty the roads may be, on throwing them off, you find your trowsers quite clean and dry. The great difficulty in walking is to keep the feet in good order. This can be done if a little attention be paid at first. For some days before starting, dip your feet in hot water as often as possible for a few moments, and then rub them quite dry. Let this be done morning and evening till you find the feet quite free from a damp feeling. Provide yourself with a good sized tin box, full of the best yellow, or, as it is called in some places, soft soap. It has something the appearance of honey in the comb. Before starting in the morning, rub the soles of the feet, especially about the heels and toes, with the soap, until it has the appearance of a good lather for shaving, and then put your woollen stockings on. Let this be done every morning before starting, and you will find, even in the hottest or wettest weather, you will be able to do a great deal of work, and at the end of the day find your feet cool and free from blisters.

Instead of washing the feet at the end of a journey, rub them first with a damp cloth, and then dry them completely. In some places on the continent it is not possible to get this soap: but in almost every apothecary's shop you can purchase Stag fat, which does very well: and if you cannot get Stag fat, buy Goose fat or Hog's lard. With these fats, I first rubbed the feet with spirits, which is an improvement; but nothing can stand comparison with yellow soap. Have your stockings washed as often as possible; and if they have not time to dry during the night, they can easily be buckled on the outside of the knapsack. By attending to these directions and by instantly rubbing yourself dry and putting on fresh flannels and linen at the end of your day's work, and eating as much animal food as possible, yet drinking no more than is necessary, both body and feet will be in the highest condition.

To prevent thirst in hot weather, nothing is better than to take a great quantity of fresh butter with your bread for breakfast. Avoid drinking water as you would poison: in short, drink as little as possible of any thing, and do not give way to the first sensation of thirst. I strongly recommend starting at day-break, having previously taken breakfast.—*Dublin Journal.*

METEOROLOGY.

There has always been one great obstacle to the cultivation of those branches of Natural History which depend upon continuous observation; and this arises from their very nature—namely, that while the powers of Nature are ever active and require no interval of rest, the mind of the most

active and determined observer soon sinks under repeated exertion, and can only be restored by periods of repose. While *Man* sleeps, *Nature* works; and we often find that in a brief space we have irrecoverably lost some important link in a chain of evidence which might have led to important results. These remarks apply with peculiar force to the science of Meteorology, in which we have to mark the operations of agents so numerous and apparently so variable that they defy the most acute sagacity to foresee their effects, or comprehend their causes.

Human ingenuity has been busily employed in devising methods to meet this difficulty. Instruments have been invented to make the elements leave a record of some of their most important changes. Thus the self-registering thermometers of Dr. Rutherford and Mr. Six are so constructed that they show the highest and lowest degree of temperature which occurs between any two observations: the new anemometer of Professor Whewell marks the force and direction of the wind between two periods of time. These are important inventions, and will do much to advance our knowledge of meteorological phenomena: but they have one great defect—they register all the changes which have occurred between any two points of time, but they do not mark the precise moment when any particular change takes place. We learn, for instance, from Dr. Rutherford's thermometer, the coldest temperature during the night and the hottest during the day; but we have no means of knowing the exact time when those degrees of temperature took place.

This desirable object, as far as concerns the wind and the rain, has been accomplished by an instrument invented by Mr. Follett Osler, of Birmingham, "The Self-registering Anemometer and Rain-guage," which has been for some time in operation at the rooms of the Birmingham Philosophical Institution, the results of which, united to the daily observations of the barometer, the maximum and minimum thermometer, and Daniel's hygrometer, are embodied in the following tables. It may be necessary to explain to those readers of *The Analyst* who have not seen the self-registering anemometer, a few particulars of its construction. In this instrument, the vane, which is about 16 feet in length, is attached to the hollow metal rod which carries it; consequently, the rod moves with the vane. At the lower end of the tube is a small pinion, which works into an horizontal rack which slides backwards and forwards as the wind moves the vane: to this rack a pencil is attached, which marks every movement in the direction of the wind, on a paper ruled with the cardinal points, and so adjusted as to move forwards at the rate of half an inch per hour by means of a clock. The force or velocity of the wind is at the same time ascertained by a plate, one foot square, placed at right angles to the vane, supported by two light bars running on friction rollers and communicating with a spiral spring in such a way that the plate cannot be affected by the wind's pressure without constantly acting on this spring and communicating its action by a silver wire passing down the centre of the tube to another pencil, by which it thus registers its degree of force. The quantity of rain is registered on the same paper, by its weight acting upon a balance which moves in proportion to the quantity falling. The motion of the balance being communicated to a pencil attached to it, the result is recorded. The receiver is so arranged that when a quarter of an inch of rain has fallen it turns upon its axis and discharges its contents, and the balance being thus relieved from its weight, the pencil returns to zero.

It will readily be seen from this brief description that by means of this instrument we obtain a correct record of every change that takes place in the direction and force of the wind, and every particular connected with the fall of rain, all written down by the agency of those elements themselves, at the precise moment such change occurs. It is impossible to forsee the influence this invention may have on the progress of Meteorology, if it should be generally adopted; and a few facts, as elicited by the one at the Philosophical Institution within the last three months, will, I hope, not be unacceptable. The middle of the last month of the year 1837, was remarkable for the prevalence of high winds. On Monday, December 18th, in the storm from the S.W. which lasted for fourteen hours, the anemometer registered a force of sixteen pounds pressure on the square foot, which is equal to a velocity of nearly sixty miles an hour. The highest gust of wind happened at twenty minutes before seven p.m. On the following Wednesday, (December 20), this gale was exceeded in force, though not in duration, the highest pressure of the wind on that day amounting to *twenty-one pounds and a half* on the square foot. This happened at a quarter before one p.m., and at five p.m. it again obtained a force of twenty pounds. It is worthy of notice, that the highest temperature indicated by the external thermometer, during the month, happened on this day. It was 55° F. and was attained a few minutes before one o'clock. About the same time, the most violent gust of wind was registered. The present year opened with mild weather; the minimum of the external thermometer on January 1st, was 41°. On the 2d of January, a violent gale from the S.S.E. caused the instrument to register a force of sixteen pounds on the square foot. On the 9th of February, a remarkable variation of the wind was indicated; at half-past eleven a.m. its direction changed from S.S.E. to N.N.W. within the space of a quarter of an hour, and the barometer began to rise, and the thermometer to fall. The barometer at nine a.m. had fallen to 28.14 inches, which is much lower than it had ever been previously observed at the Philosophical Institution. The greatest force of the wind was five pounds and a half on the square foot. On the 12th the wind changed from W. N. W. to E. N. E. within three quarters of an hour, beginning at five minutes before ten a.m. In this instance, there was no action upon the barometer. On the 15th, there was a brisk wind from the E. S. E. at half-past five p.m. One gust reached a force of eight pounds and a half, when the wind immediately changed to N. N. E. On the following day (the 16th), the direction became due East, and at ten minutes before two p.m. the force amounted to *eighteen pounds and a half*. On the 25th, the barometer was lower than on the 9th. It will be seen by the Journal that the mercury had fallen to 28.12 inches.

It would be superfluous to make any remark upon these facts; for, it is evident from the connection shown between the change in the current of the air and its alteration in weight as indicated in the observation on the 9th of February, that if, in conjunction with the Anemometer, a barometer could have indicated the *exact instant* when the mercury began to move, it might have led to important discoveries in Meteorology.

W. ICK.

Birmingham Philosophical Institution,
March, 15, 1838.

DIVI BOTANICI;

OR, SKETCHES OF BOTANISTS WHOSE MERITS ARE COMMEMORATED IN THE APPELLATIONS OF PLANTS.

Article the Third.

Without being used in a figurative acceptation, magnanimous pusillanimity might well express that form of disintegrity in the mental manifestations, where a person has lost his power of exercising the heroism of virtuous fortitude in enduring unsurmountable misfortunes or miseries, and recklessly seizes the hardihood of desperate cowardice in escaping from his wretchedness by desertion of his duties and a defiance of the Deity, in rushing headlong into self-destruction. Such a procedure, in all its sources and bearings, is utterly repugnant to the natural instincts which maintain the desire and care of existence originally implanted, by the Creator, in the first of every animated race for transmission to its latest progeny; and such a procedure also is irreconcilably adverse to the innate faculties of mind that intuitively encourage man in cultivating its pure moral and religious principles; and such a procedure moreover constitutes a most outrageous transgression of the all-righteous precepts instituted and revealed by the Divinity himself in the Sacred Scriptures, for advancing the perfectibility of his intelligent and amenable offspring. Hence, in the mere act of self-destruction, independent of all other circumstances, there is evidence both manifest and conclusive, that the forlorn suicide had become misconscious of his pride or despair, that he had lost ability to obey the highest of his feelings and sentiments and rational energies, that he had been thrown by his malady into the state that required him to be considered as partially insane, though not in all cases irresponsible. While then, with all fairness, it should be concluded that an act—in its three-fold character, unnatural, impious and irrational—must absolutely result from the causes of derangement in the mental manifestations; with equal fairness and strength of testimony, it may also be concluded that, when it is perpetrated by sages and saints, by individuals eminently distinguished for the sublimities of wisdom and the excellencies of piety, the same act originates from the causes of disorder in the functions of some or many of the mental faculties, while the rest remain unaffected or imperceptibly disturbed. Well and most wofully confirmed is this doc-

trine of partial insanity, by the melancholy fate which extinguished the fortunes of Marcus Cato,* of his daughter Porcia, and of her husband Marcus Junius Brutus—all so illustrious for their high mental endowments, their extensive learning, and their patriotic virtues. These and every other ennobling distinction of character were depraved, in those celebrated personages, by the effects of a profound constitutional impregnation with the germs of that passion which discloses itself in the manifestations of suicidal insanity.

Among the victims to the pest of magnanimous pusillanimity, and the intenseness of its impulses, not unhonoured is the name of Juba, the Mauritanian prince, who perilled his own destiny and that of his kingdom, by associating its resources with those of the Roman republicans, in their resistance to the Cæsarean faction and its encroachments on the revered institutions of their country. When the disastrous field of Thapsus* had overwhelmed their armies in ruin and dismay, the vanquished monarch had his inherent malady thrown into a state of exaltation which impelled him to snatch at

* Cato of Utica and Brutus his son-in-law are wont to be represented as superlative patriots, in whose deportment the highest moral, political and religious virtues appear with a practical pre-eminence. Subjected to the scan of reason and of science however, these virtuous displays become the features of a fondled affection, habitually deriving its sources from a misbalancement of the mental economy. When pressed to extremity by the reverses of a "fratricidal" warfare, these stern senators resolved deliberately, but with the recklessness of insolent despair, to adopt the base resource of suicide as the best expedient for anticipating the horrors of captivity and degradation. Hence came the scenes of the three-fold tragedy: when, with the composure of deranged reflection irretrievably bewildered by misconceptions of the Platonic philosophy, Cato killed himself; or, in gentler phrase, *vitâ se abdicavit:* then, after being a murderer of his friend and benefactor, Brutus assisted his own soul in disembodying itself, inconscious of guilt or impenitence: and then, disdaining to survive the disasters of her husband and father, Porcia put an end to her existence by swallowing a piece of burning coal. These facts, though terrible, are instructive; they illustrate the horrid vigour of concentrated insanity; they exemplify the monstrous obliquity of sentiment engendered imperceptibly by the hallucinations of pride.

* Juba united his native forces with the republican army under Scipio, and they were defeated by Cæsar near Thapsus, an African town which this battle rendered famous with posterity. Being deserted by his Mauritanian subjects, Juba terminated his unfortunate career by a method in his madness, which evinced distinctly that its wild ascendancy had prostrated for ever the highest principles of his mind's immortal nature. Juba and his friend Petreius, a Roman officer, agreed to execute their mutual destruction by engaging in a single combat: in this, the king fell first; and the survivor, by his own commands, was slaughtered by a slave.

an inglorious escape from ignominy in a rush from life, while his family, his kindred, and many of his people were carried captives to Rome, to swell the execrable glories of her first Emperor's triumph. With others of his degraded compatriots, Juba the king's son endured this indignity—a cruel infliction, in every sense most hatefully selfish and arrogant. Nevertheless, so powerful are the native energies of wisdom and virtue, that this prince enabled himself, by their judicious culture and adaptations, to establish the sovereignty of character, even among the supercilious oppressors by whom the liberties of his father-land were exterminated.

Historians* evidently delight to expatiate on the amenity of Juba's dispositions and the purity of his principles, on his extraordinary proficiency in literature and philosophy, and on the splendid development of his fortunes. While the nations all around were harrassed with the flagitious enormities of war and rapine, and while Rome herself, their imperial enslaver, was trembling in the dread of imminent destruction by the strife of her degenerate citizens, the expatriated Prince found consolation and happiness, under his manifold bereavements, in the solace and tranquility of philosophical contemplation. Here, however, as if moderation had not ensured its certain reward, as if the Creator's providence did not over-rule all the events of life to the best though often inscrutable purposes, the short-sighted chroniclers of that dissolute age were eloquent in ascribing the causes and consummation of Juba's prosperity to the results of fortuitous operations. Thus, say the ancient biologists, his captivity became the source of the greatest honours, and his application to study procured him more glory than he could have obtained from the inheritance of a kingdom.

By the courteousness of his manners, Juba gained the affections and respect of the Roman people ; and, in recompense of his exemplary fidelity, Augustus gave him Cleopatra the daughter of Antony

* Many interesting observations illustrative of Juba's character, both as a king and a scholar, are recorded in the compositions of Greek and Roman historians. For instance, Strabo ; *Rerum Geographicarum libri septemdecim græcé et latiné, curante Thomâ Falconer ; folio, 2 tomis, Oxonii, 1807 :* Dion Cassius ; *Historiæ Romanæ quæ supersunt, græcé et latiné, curâ H. S. Reimari ; folio, 2 tomis, Hamburgi, 1750 :* Pliny ; *Naturalis Historiæ, libri* xxxvii *; folio, Venetiis, 1469 ; folio, 3 tomis, Bevolini, 1766 ;* and Dr. Holland's English version : Suetonius ; *De XII Cæsarum vitis, ex recensione Grævii, 4to, Trajecti ad Rhenum, 1672 ;* and the English versions by Dr. Holland, Jabez Hughes, and Dr. Thomson who has increased the value of his translation by adding useful annotations, and a review of the government and literature of the Romans at different periods.

and the Egyptian queen in marriage, bestowed on him the title of king, and made him sovereign of all the territories which his father formerly possessed. After his decease, so greatly and so deservedly revered were the righteousness and benignity of his patriotic reign, that his people instituted a solemn ritual for worshiping, with divine honours,* the character and memory of their philanthropic monarch —the device of a grateful veneration unimbued with the Celestial Wisdom revealed to man, for the exaltation of his intellects in guiding the exercise of his moral and religious powers.

Besides administering the affairs of his kingdom with assiduity and justice, Juba enjoyed a favourite occupation in the study of literature and the sciences. From facts procured by personal investigation, he composed a natural history of the Mauritanian regions: he also wrote monographs on the Euphorbium, on the Tree that yields Frankincense, and on the οπος,† *Laser* or juice of the Silphi-

* By the Athenians, a statue was raised and consecrated in honour of this illustrious prince, who preferred the quiet pursuits of science and philanthropy to the more dazzling enterprizes of robbery and carnage in war. Tradition relates the tale, that the Æthiopians were the first inhabitants of the earth; that they were the first who worshiped the gods; and that, for this piety, their country was never invaded by a foreign enemy. The posterity of these reputed progenitors of the human race, exalted Juba to the "divine order," and worshiped him as a deity; such was the extravagant devotion with which the ancient Polytheists were prone to regard great personages, distinguished for generous or patriotic excellency; and such are the fruits of an energetic veneration when undisciplined in true wisdom or mistrained by the ignorance or artifice of its guides.

† οπος was the term anciently used for designating *Juice* in general: under restriction, it denoted the crude sap of plants, whether expressed or extilled: ultimately, it came to denote *the Juice*, allusively to that of the *Silphium*, with a signification of pre-eminence: but, in its earliest acceptation, the word usually represented the milky juice of the wild Fig-tree employed for curdling milk, by the primitive races of men. The Laser was a resinous gum which the Greeks and Romans reckoned equally valuable as gold, both for culinary and medicinal purposes. At Rome, it obtained the highest consideration in being deposited in the national treasury as available property. When Julius Cæsar usurped the government of his country, he seized and sold one hundred and eleven pounds of the Laser, as his chief resource for defraying the expenses of the first civil war,—a curious fact which displays the effect of appreciating things, whether plants or books, according to their rarity. This precious substance was transparent, russet-coloured, and fragrant; in some of its sensible qualities, it resembled myrrh; in taste, it was hot, tart, pungent; its virtues were inestimable, in that they proved a reputed antidote to all sorts of poison, could restore sight to the blind, and had the power of protecting youth from the dreaded encroachments of old age! Various places in Syria, Libya, Media and Armenia, but

um, emphatically so designated from the extravagant estimation in which it was then held by the Roman people. Another work of his was an elaborate account of the Roman transactions, in the Greek language, and his authority was often quoted with commendatory remarks by the ancients: only a few fragments of this, however, have escaped the havoc which interrupted the first stage of European civilization. Another treatise of his contained descriptions of Arabia and of the Assyrian antiquities, after the method of Berosus*

especially the mountainous districts around Cyrené, furnished the supplies of this rare product; but much uncertainty, together with a profusion of conjectures, has been exhibited in the discussions of naturalists, in their essays to determine the precise vegetable from which the Laser was procured. Nearly two thousand years since, the knowledge of this was lost to the herbalists and the physicians; and, notwithstanding the zealous assiduity and science of their successors in botanical research, they have not ascertained more than the probability, that the high-prized Cyrenean gum was the exudation of an umbelliferous plant. With the ancient Greek phytographers, the term ΣΙΛΦΙΟΝ denominated that wondrous vegetable which originally enjoyed the reputation of yielding the Laser; and, by descriptive comparison, it had a thick root, a stem resembling that of a *Ferula* and leaves like those of an *Apium*, with large flattened and leaf-like seeds. From incisions in the root and stem of the *Silphion*, there issued the fluid which, from *sirpe* changed to *serpitium*, the Latins first called *lac serpitium* and then corrupted into *laserpitium*—a term sufficiently barbarous although retained as a generic appellation in modern botanical nomenclature. From the growth and culture of this concrete juice, many advantages resulted to the "political economy" of Cyrené; and, in acknowledgement of these, the inhabitants had a figure of the Silphion represented on the reverse of their medals, as the emblem of their flourishing "pentapolitan" state; with reference to the same source of celebrity, also designated the "*Silphiferous* region."—Garcias ab Orta: *Colloquias das Simples y Droguas he Cousas Medicinais da India;* 4to, *Goa*, 1563. Theophrasti *Historia Plantarum, græcé et latiné, curante J. B. a Stapel; folio, Amstelodami*, 1644, pp. 586, 598, with figures of the Cyrenian medal and plants. Plinii *Historia Naturalis; Lib.* v, *Cap.* v; *Lib.* xxii, *Cap.* xxiii. Dr. Holland's Pliny, vol. i, p. 94, and vol. ii, p. 133. Dioscorides *Opera, græcé et latiné, ex interpretatione J. A. Saraceni; folio, Francofurti*, 1598, *Cap. xciv, p.* 212. L. J. Conti, M.D. *Il Vero Silfio overo Laserpitio degli antichi; Giornale de' Letterati; 4to, Venezia*, 1673. Prosterus Alpinus, M.D. *De Plantis Exoticis Libri, 4to, Venetiis*, 1628, p. 211. John Lawrence; *A New Systeme of Agriculture; including a particular account of the famous Silphium of the Ancients; folio, London*, 1726. A. F. Walther: *Programma de Silphio; 4to, Lipsiæ*, 1746. Dictionnaire Universel *de Matière Medicale et de Thérapeutique Générale; par F. V. Mérat, M.D. et A. J. De Lens, M.D.* 8vo, *Paris*, 1832; *Tome iv, p.* 43, where several Memoirs on the Laser are cited.

* Babylon was the birth-place of Berosus, and he officiated as a priest of the temple consecrated, in that city, to the adoration of God the creative deity whose emblem was the sun, designated Belus or Baal by His oriental

in his topographical collections. Juba was also the author of essays on grammar and painting and Roman archæology, of some dramatic sketches, and of various pieces on the nature and economy of animals—all of which have irretrievably perished. Such then, are the outlines of Juba's portraiture, as a prince and a philosopher: it was while taking delight in the "study of mankind" amid the blandishments of imperial favour, that he found happiness in cultivating the friendship of Antonius Musa and his illustrious brother

EUPHORBUS *the Physician*.—When Pythagoras proclaimed the rule for his disciples, ΑΠΕΧΕΣΘΑΙ ΤΩΝΚΤΑΜΩΝ, *fabis abstine, abstain from beans*,* his precept shewed clearly that the sage himself was not "of Leicestershire;" but, when he required the same disciples to admit his doctrine of the *Metempsychosis* or transmigration of souls, he shewed with equal clearness that he had obtained initiation into the hieroglyphic mysteries of the Egyptian psychosophy, and into those on which the gymnosophists of India were wont to contemplate in their solitary retreats. With a view to establish the truth of this chimerical notion, the Samian philosopher fell into the flagrant moral obliquity of affirming that his own soul had heretofore inhabited the bodies of Æthalides,† and of Hermotimus, and of Euphorbus, a

votaries, and Bel by His western worshippers, under the druidic theosophy. Berosus acquired an extraordinary reputation for the knowledge and experience, gained by foreign travel. He visited Greece, and made a long residence at Athens, whose clever but cruelly fickle "*People*" erected a statue in the Γυμνάσιον or place for exercises, with the object of honouring his learning. He flourished in the third century before the vulgar era; and, besides distinguishing himself by his astronomical predictions, he composed a history of the Chaldæan nations; but not more than a few fragments of this work have been preserved from the ravages of barbarism and time—these unrestrainable destroyers.—Flavius Josephus: *Opera, græcé et latiné, cum versione novâ et notis Joannis Hudsonii; folio, 2 tomis, Oxonii*, 1720; and Whiston's translation.

* Varying greatly in their ingenuity, many interpretations of this singular preceptive apothegm have been propounded, both by metaphysicians and archæologists. More probable than most of the others, however, is that which would represent the Sage of Samos as desirous of declaring by it, his profound abhorrence of the *Bean* as an instrument, like the shell in ostracism, of secret and irresponsible voting—a cowardly and tyrannical expedient by which many excellent persons and much valuable property were sacrificed by the villainy of malice or selfishness.

† Æthalides enjoyed the distinction of being reputed a son of the god Mercury: he was a herald by profession; and, through his father's influence, he obtained the singular privilege of appearing among the living and the dead, at stated times.—Hermotimus was a Clazomenian by birth, and a revered soothsayer by character. His ghostly freaks and their issue are re-

brave Trojan warrior who was slain in one of those sanguinary conflicts which wrought his country's utter devastation. His dead body suffered the indignity of being stripped of its armour on the field of battle, and his shield was afterwards deposited as a trophy in the temple of Juno at Argos, by the king Menelaus who had won the high-valued spoils by their owner's slaughter. Thus it is, that men reputed wise and great see glory in the destruction of their fellow-men, during that stage of the social system when the Mind has not discovered the natural supremacy of its moral sentiments, but exults in yielding a ready submission to the impulses of its own animal instincts.

By the annalists of primæval transactions, the inquisitive naturalist is left unacquainted with facts or incidents which might justify him in concluding that, like other co-eval military chiefs, the Trojan Euphorbus was eminent for his knowledge of plants, or skilful in their medicinal applications. Neither, in ancient memorials, is it stated that the name of this personage was ever conferred on any vegetable, for any reason, notwithstanding his celebrity ranks high on the records of heroical renown. With regard to Euphorbus the physician, however, his position stands distinctly the reverse. It has been drawn concisely, but comprehensively, in the sketches of Pliny the naturalist; and, in being delineated by an almost cotemporary hand, these sketches would be founded on statements considerately weighed with a view to faithfulness of representation. While enumerating the African nations geographically, he introduces this descriptive account:—"Juba, the first prince who reigned over both the Mauritanian kingdoms and acquired extraordinary fame as a philosopher, relates in his natural history of Mount Atlas that the herb Euphorbia grows there, and was so denominated in honour of his physician, by whom the plant was discovered." Again, in that section of his work which consists of philosophical commentaries on the nature of vegetables *sponte nascentium*, the

lated by Pliny the naturalist, from legendary chronicles. In one of the prophet's ecstacies, actual or assumed, his body was taken for dead and consumed on a funeral pyre, by his family.—For support of his psychological delusion, Pythagoras courageously asserted his soul's recollection of many exploits achieved by Euphorbus, while it inspirited that hero's body; and, with a similar aim, the "divine instructor" practised the experiment of pointing out the Trojan's shield in the temple, where it had remained for ages, at first sight and without assistance! Such fables are not uninstructive: they constitute a lofty beacon to the Mind, by displaying the wild recklessness of imagination when it escapes from control of the moral principle.

Roman phytographer* inserts these curious and gratifying observations:—"No longer ago than in our forefathers' daies," he relates, "Juba, king of Mauritania, found out the herb *Euphorbia*, which he so called after the name of his own physitian Euphorbus, brother to that learned Musa, physitian to Augustus Cæsar, who saued the life of the said emperor. These two brethren physitians joined together in counsell, and gaue direction for to wash the body all ouer in much cold water, thereby to knit and bind the pores of the skin; for, before their time, the manner was to bathe in hot water only, as we may see plainly in Homer the poet. But now, to return vnto our herb Euphorbia, the foresaid king Juba wrote one entire book, at this day extant, wherein he doth nothing else but expressly set forth the commendable vertues and properties of this one herb. He found the same upon the Mountain Atlas where, he says, it is to be seen bearing leaues resembling branc-vrsin: so strong and forcible it is, that those who receive the juice issuing from it, must stand a good way off; for the manner is, to launce it first, and then presently to retire backe, and so at the end of a long pole to put vnder it a trey made of a kid's stomach for a receptory, into which there runneth forth out of the plant, a white liquor like unto milke, which, when it is dried and growne together, resembleth in shew a lumpe of frankincense. They that have the gathering of this juice, called *Euphorbium*, find this benefit thereby, that they see more clearly than they did before: an excellent remedy this is against the venom of serpents; for whatsoever place is stung by them, make an incision at the upper part of the wound and apply thereto this medicinable liquor, and it will surely cure it." Several inferences, some probable, others certain, naturally arise out of these statements. Hence then, it would appear that Euphorbus had at first been subjected to the same hard fortune as Antonius Musa his brother, in being thrown into a servile condition: that he co-operated in the unusual but successful method of treating Augustus with cold affusions: that he accompanied Juba as his physician, on the restoration of this prince's ancestral dominions by the emperor's munificence: that Euphorbus assisted at the discovery, or was himself the discoverer, of the vegetable which his sovereign then styled *Euphorbia* by an express denomination: and that, in this way, the king manifested an affectionate generosity, in honouring the merits of his medical officer by the rites of a "deification" which assigned

* Dr. Holland's English version of Pliny's *Natural History of the World* Vol. ii, p. 222; and Book xxv, Chapter vii of the original.

him an early position among the herbarists whose names are commemorated in the appellations of plants.

EUPHORBIA *the Plant.*—Reasons have been deduced from an ancient writing for the conjecture, that the name *Euphorbium* was applied to some vegetable production, previously to the time when Juba and his physician were engaged in their botanical researches. When this proposition is entertained, its grounds are taken from an interpretation of certain enigmatical Greek verses, ascribed to Herrenius Philo,* a physician and philosopher of Tarsus, who invented the *Philonium*, a celebrated anodyne composition. His metrical instructions for preparing this medicine, are abundantly obscure; and, in the original version, they constitute an exquisite anthological curiosity. For instance, one of the mystical ingredients is "*the slayer of the son of Menœtius among the Trojans;*" and another stands for interpretation, as *the fair and fragrance-breathing hair of the god-like one, whose blood glistens in mercurial plants;* which, in terms intelligible, may stand for the juice of white poppies or opium, even more deservedly renowned than Mercury's *Caduceus*, for its somniferous energies.

Some commentators on this singular production are inclined to consider the "*Slayer of Menœtiades*" as the symbolical representative of Euphorbus the Trojan chief so justly applauded for his patriotic heroism; and, on this interpretation, they regard him as the personage for whose honour the herb Euphorbia had its distinctive name originally appropriated. Now, by all history, it is made evident that, except in the machinery of a poetical fiction, Euphorbus cannot be held for the slayer of Patroclus, because this friend of Achilles certainly fell by the hand of Hector, who seized the armour of his lifeless enemy. Moreover, Philo's celebrity was nearly coeval with that of Antonius Musa and his brother's: indeed, it was later than their's according to the best chronology:† there would, therefore, be no improbability in concluding, that Juba's monograph on the Euphorbia and the history of its discovery were known to Philo himself, who might choose to elaborate an allegory exhibiting an ancient name as the prototype of a new-made appellation, in the wildness of his predilection for the display of fantastic imagery.

* Stephanus Byzantinus: *De Urbibus, græcé et latinè, curis Berkelii et Gronovii; folio, Lugd. Bat.* 1694. Daniel le Clerc: *Histoire de la Medecine;* 4to, Amsterdam, 1702; Part III, p. 14, where an attempt to unmystify the *Philonium* may be examined.

† Euphorbus and Musa cured Augustus, who died in A.D. 14, and Philo *flourished* in A.D. 23, according to the most accurate history of medicine.

Still farther strengthened is this conclusion by the fact, that the Spurge is not mentioned by Theophrastus*, who flourished at the long interval of three centuries and a half before the age of the distinguished Mauritanian prince, and his physician. Without limitation also, it is declared by Dioscorides†, who compiled his Phytology soon after Philo's decease, "that confessedly the Euphorbium was discovered on Mount Atlas during Juba's reign;" while, on the other hand no tradition, and no record either, exist to shew that even the admired *Philonium* itself was divulged for practical use antecedently to the period here specified. Again and expressly, there comes the definite affirmation of Pliny‡, who was born in the year of Philo's mid-age, that the *Euphorbia* was actually discovered and denominated by the Mauritanian king and his associates in the pleasant exercises of "herbarization." Furthermore and conclusively, about two hundred years subsequent to its discovery, Galen‖ essayed to describe the Philonium and to unriddle the cryptical metres which enumerate its elements, in an exposition of these and their salutary qualities; and, in this also, he admits for an established truth the statement of Pliny, "*volumen Jubæ quoque extat de herbâ Euphorbiâ, et clarum ejus præconium,*" the existence of Juba's book on the Spurge, and its high reputation. Throughout succeeding ages, even to the present time, and with one exception§

* Theophrasti Eresii *de Historiâ Plantarum libri decem græcé et latiné, curâ Joannes Bodæi ex Stapel; folio, Amstelodami;* 1644.—Theophrastus was a diligent collector of materials for his unartificial, or rather natural, system of Botany; and in the fact of the *Euphorbium* being unknown to him, there is something in favour of the claim, that its discovery should be ascribed to Juba's physician. In his commentaries on Book XI, chapter x, the learned Editor introduces an elaborate dissertation on the *Euphorbium*, its discovery, name, description, preparation, and medicinal qualities; p. 1056—1058.

† Pedacius Dioscorides: *Opera quæ extant omnia, græcé et latiné; curante J. A. Saraceno, M.D. folio, Francofurti,* 1598: *Lib.* iii, *cap.* xcvi, p. 214.

‡ *Historiæ Mundi, libri* xxxvii; *folio, Lugduni,* 1561; *Lib.* v, *cap.* 1, p. 67. Here the naturalist represents Euphorbus as the discoverer of the plant, in express terms founded on Juba's recognized authority. The king composed a natural history of Mount Atlas; and, says Pliny, concerning this region, *prodidit præterque gigni ibi herbam Euphorbiam nomine, ab inventore medico suo appellatam,* he related moreover that there grows on that mountain the herb named Euphorbia, from his physician, its discoverer.

‖ Claudius Galenus: *De Compositione Medicamentorum secundum loca, curis Cornarii et Macchelli;* 12*mo, Lugduni,* 1540.—Galen settled at Rome as a physician in A.D. 165, about one hundred years after the publication of Juba's books on the *Euphorbium*, and the Natural History of his kingdom.

§ This was propounded by Claude de Saumaise, in latin *Salmasius*, an ingenious French scholar who acquired an extraordinary celebrity in criticism

only, the fact of this royal tribute to a naturalist's approved merits has been unreservedly admitted as an authentic record by the latter Greek, the Latin, Arabian, and modern phytographers. These reasons then, with others that might be adduced to the same effect, unite in authorising the historical induction—that this plant derived its original name from the generosity of Juba, who consecrated its appropriate designation to be a memorial of his affection for Musa's brother; and that, therefore, both the rules of Linnæus and the laws of eternal justice require the glory of this philosophical deification to be recognized as the right of Euphorbus the physician.

Under the Euphorbia as a generic head, the *Linnæan* botanists have arranged a numerous tribe, embracing four hundred species of vegetables; and, in the system styled *Natural*, this plant represents

and literature. He was born in 1588, and died in 1653; but, as one of his learned countrymen observes, "the high reputation of Saumaise has not been admitted by posterity: he is generally regarded as "*un critique bizarre, aigre et présomptueux;*" yet, he adds, although "*ce savant eut beaucoup de ridicules, il eut aussi de belles qualités qui les compensèrent.*" This "savant" fancied that the *Euphorbium* is specified in one of Meleager's epigrams, where the ιυφοεβης ακανθης is compared to the poetry of Archilochus, in allusion to its satirical causticity; but the phenomenon would be somewhat marvellous, if the ancient physicians were unacquainted with an herb and its active energies which an ancient versifier knew so well as to employ them in a figurative illustration. There is a miswriting here, however; for it is proved by Fabricius that the words should be φοβιερης ακανθης, with an emblematical reference to the stinging sarcasms of Archilochus which might have suggested the phrases *archilochia edicta* for virulent edicts, and *archilochium carmen* for severe or railing verse.—See Salmasii *Exercitationes de Homonymis Hyles Iatricæ; folio, Ultrajecti*, 1689: and *Bibliotheca Græca, sive notitia scriptorum veterum Græcorum; auctore J. A. Fabricio: xii Tomis, 4to, Hamburgi*, 1790—1809.—Archilochus was a native of Paros: he lived in the seventh century before the Christian era: his writings consisted of epigrams, odes, satires, and elegies. Lycambes assented to the marriage of his daughter Neobule, with the poet; but she was given to a wealthier suitor, and the disappointment so incensed the cynic that he satirised both the father and his child with unendurable severity, and they hanged themselves in a fit of despair. The satirist was banished from Sparta, as an indelicate and petulant intermeddler; and he afterwards lost his life by assassination.—Meleager was born at Tyre, and died in the island of Cos, so famous as the birth-place of Hippocrates, Apelles, and Simonides, and also for its wine and silk-worms. He flourished about one hundred years before our Saviour's advent; and it is to the good taste and zeal of Meleager that the admirers of ancient poetry are indebted for the 'ΑΝΘΟΛΟΓΙΑ, a collection of Greek epigrams which he selected from forty-six of the most esteemed poets.—See *Anthologia Græca, ab Hugone Grotio latino carmine reddita, ab Hieronimo de Bosch edita; quatuor tomis, 4to, Ultrajecti*, 1795—1810

the Euphorbiaceæ—a comprehensive *family*, in which not less than eighty-six genera, including about one thousand specific diversities are distributed. Considered with regard to the products it yields for medicinal purposes and to the deleterious qualities of many plants comprehended in it, this constitutes one of the most important groupes in the vegetable kingdom. Almost all the Euphorbiaceæ, especially the herbaceous kinds, are distinguished by the secretion of an acrid milky fluid which is sometimes volatile, always caustic. It forms a gum-resinous substance; and, in this, their active properties reside. When imperfectly oxygenated, this substance resembles the essential oils in its fragrance and volatility: as a principle, the *caoutchouc* or elastic resin enters into its elementary composition. All the parts of these vegetables, particularly the leaves and roots and seeds, are lactescent; and the name *Euphorbium*, applied to their milk-white juice in ancient times, has not been rejected by modern naturalists. Originally, however, it would represent no more than the products of those kinds of the Euphorbia, which were first discriminated as the sources of a substance possessing energies capable of powerfully affecting the animal economy.

As the palpable qualities of this herb would be discerned soon after its discovery, there is evident probability in the conclusion, that it was administered as a remedy by Juba's physician; and that, on the results proving beneficial, its employment would readily be adopted by others in the treatment of diseases. Thus, during the lapse of twenty years, its existence and efficacy would gradually be revealed to many herbarists and healers, in different regions of the Roman empire; and thus also, the Cilician doctor might have acquired a knowledge and some practical experience of its agency, when he undertook the composition of his far-famed *Philonium*, with the "slayer of Menœtiades" as an effective ingredient.

About thirty years later, and nearly at the same period, the Euphorbium was recognized and described, both physically and botanically, by Dioscorides* and Pliny* in their esteemed phytographical collections. Subsequently, ever since the days of these naturalists, a due attention has been devoted to the consideration of its virtues,

* See the citations in notes to previous pages of this volume; also *Dioscoride fatto di Greco Italiano, per Fausto da Longiano; Venezia*, 1542; *libro terzo capitolo* 96, *p.* 153—4; and *Pedanii Dioscoridis Anazarbei de Medicinali Materiâ libri sex, Joanne Ruellio Suessionensi interprete*; 8vo, *Lugduni*, 1552, *p.* 407: this second edition is enlarged by the insertion of annotations and thirty additional figures of plants.

by Galen* in his *Discourse on the Composition of Medicines;* by Oribasius† in his *Medical Collections;* by Ætius of Amida‡ in his *Principles of Pharmacy;* by Alexander of Tralles,‖ in his *Prac-*

* Consult his treatise noted on a preceding page, and his whole works edited and illustrated by René Chartier, M.D. in thirteen volumes; *folio, græcé et latiné, Parisiis,* 1639,—a magnificent collection in which the works of Hippocrates are included.

† Oribasii Sardiani *Collectorum Medicinalium libri septemdecim; J. B. Rasario, M.D. interprete;* 8vo, *Parisiis,* 1555, *p.* 197. His eleventh, twelfth, and thirteenth Books contain the description of *Simples* and their medical properties, from Dioscorides, in alphabetical order.—Oribasius was a native of Sardis; he rose to the high rank of "archiater" to the emperor Julian whose confidence and friendship he deservedly enjoyed. On the death of his sovereign in A.D. 363, the physician had to endure much spiteful and malicious persecution. This was consummated by his banishment beyond the Roman pale, with deprivation of all his honours and property. His fortitude however, and his "useful knowledge" soon gained for him the good-will and veneration of the "Barbarians:" his wonderful cures astonished them, and so overpowered their minds with gratitude that they adored him as the tutelary deity of their nation. Ultimately, he was restored to his country; rewarded with wealth and dignities: secured the imperial favour; and died at the beginning of the fifth century, in the possession of an extraordinary reputation for learning and virtue.

‡ Ætii Amideni *Librorum Medicinalium primi scilicet octo, græcé; folio, Venetiis,* 1534. *Ætii Amideni contractæ ex veteribus medicinæ Tetrabiblos, hoc est XVI Sermones, curante Jano Cornario; folio, Basileæ,* 1542.—Some time near the beginning of the sixth century, Ætius was born at Amida, a Mesopotamian town little noted in history, save in connexion with his name. He studied at the schools of Alexandria, and then entered on active life in that celebrated city. Afterwards, on accepting an invitation to Constantinople, he was advanced to the dignified office of "physician in ordinary" to the emperor Justinian, who also conferred on him an important civil appointment at the imperial court. Ætius enjoys the credit of having been a christian; but, if sincere, his creed was tainted with the freaks of a fantastic credulity. Both in physiology and pathology, he possesses claims to considerable approved originality; and, in being the first to describe the "*tetragnathus,*" a four-jawed venomous spider, he merited the honour of discovering a contribution to medical entomology.

‖ Alexandri Tralliani *libri duodecim, græcé et latiné, curâ Joannis Guinterii, M.D.* 8vo, *Basileæ,* 1549.—Alexander was born at Tralles, about the commencement of the sixth century. His father practised in that place as a physician, and had the happiness of seeing his five sons attain great distinction in their professions. Olympius became eminent as a barrister, Metrodorus as a grammarian, Alexander and Dioscurus as physicians, and Anthemius as an architect: in A.D. 532, he was employed in building the church of Saint Sophia, now a Mahomedan mosque, at Constantinople by the Emperor Justinian its founder. After travelling through the provinces of Gaul and Spain for the improvement of his experience, Alexander made a protracted stay in

tice of Physic; by Paul of Ægina* in his *Book of Simples;* by Actuarius† in his *System of Prescriptions;* by Messué,‡ Avicen-

Tuscany; but, whether he finished his days in Italy or in the land of his forefathers, is a circumstance unnoted in biography: even the date of his decease is unknown.

* Pauli Æginetæ *de Re Medicâ libri septem, græcé, curante Hieronymo Gemuseo, M.D. folio, Venetiis,* 1528. Pavli Æginetæ *Medici Opera, interprete Joanne Guinterio, M.D. 8vo, Lugduni,* 1589, *p.* 723, 804.—Paulus acquired the surname Ægineta from his birth-place Ægina, an island in the Ægean sea. The epoch of his career remains undetermined; from varying evidences, it has been referred to the fourth, and to the fifth, and to the eighth century. He spent several years of his youth in studying philosophy and physic, in Greece, Egypt, and other countries; and, on retiring to his native isle, he devoted his cares to the cure of sickness and his leisure to the culture of medical literature. His fame as a "Healer of Diseases" was widely extended: in history, he stands as the patriarch of the tribe of male midwives: his chirurgical precepts intercept the value of some applauded modern discoveries.

† Actuarii *de Compositione Medicamentorum liber, Joanne Ruellio interprete;* 12*mo, Parisiis,* 1539. *Actuarii Joannis filii Zachariæ Opera;* 8*vo,* 2 *tomis, Parisiis,* 1556.—John the son of Zachariah occupies an honourable position in modern medical literature as "*Actuarius*" the actuary, a designation in peculiar use at the imperial court of Constantinople, where the title had an import similar to that of physician to the sovereign and his family. Much ingenious conjecture has been exercised in attempts by successive biologists to fix the age when he flourished. From adduced reasons, it is thus variously concluded that John the "*actuarius*" lived in the twelfth, or in the thirteenth, or in the fourteenth century: but, passing these respectable speculations, he is usually regarded as the last of the Greek physicians. The incidents of this philosopher's life have escaped from the records of human action, but most of his writings are preserved: they abound with testimonies to the extent and value of ancient science, of which he is a harmonious and systematic expositor.

‡ Johannis Mesve *Opera, cum complemento et additionibus clarissimi doctoris Francisi de Pedemontio; folio, Venetiis,* 1478. *Opera Omnia, cum annotationibus variis, ab Andreâ Marino, M.D. castigata; folio, Venetiis,* 1562.—Jahiah ebn Masouiah, known in the European tongues as John Messué, was born at Khouz near the site of ancient Nineveh, towards the close of the eighth century. He was educated at Bagdad; and, in after life, he enjoyed the friendship of three successive Caliphs and was their physician: these were Haroun al Raschid, Al Mamoun and Motawakkel, the former being the munificent prince whose splendours are displayed in the "Tales of the One Thousand and One Nights." Masouiah excelled the cotemporary philosophers in his profound acquaintance with literature and the sciences: in philology, he was so eminent that the caliphs entrusted to his charge the translation of instructive writings from the Greek, Persian and Syriac languages. Among his physiological and botanical principles, some were original, some approached those of Linnæus nearly, and many will be respected by posterity. He died

na,* Serapion† and other Arabian physicians in their details of experience in treating diseases; by Silvaticus‡ in his celebrated *Pandects;* by Cuba‖ in his *Garden of Health;* by Ruelle§ in his *History of*

in A.D. 855, aged about eighty years: his religious tenets were those of the Nestorian christians.

* *Liber canonis pm⁹. quē pnceps abohali abinsceni de medicina edidit. translatus a magistro gerhardo cremonensi ī toleto ab arabico in latinum; folio, Patavii,* 1472; *Lib. II in voce* "*Euforbium*" as it stands in the alphabetical order. In this Book, he treats of more than six hundred simple medicinal substances, and these consist chiefly of vegetable products and plants. This edition of Avicenna's Canon contains only the first, second, and fourth books of the original work, but the whole was afterwards translated into Latin by Gerard of Cremona, and published; *folio, Mediolani,* 1473. Notes on Avicenna and Serapion are appended to pp. 41 and 42 of the present volume.

† Serapionis *Liber Aggregatus in Medicinis Simplicibus; translatio Symonis Januensis, interprete Abrahamo Judæo Tortuosiensi, ab Arabico in Latinum; folio, Mediolani,* 1473. *Practica dicta Breviarium: liber de Simplici Medicinâ dictus Circa-Instans; folio, Venetiis,* 1497, 1503, *ab Arabico in Latinum a Gerhardo Cremonensi translatus.*—Gerard was a native of Cremona, in Italy: he studied Arabic at Toledo, in Spain, where he passed the greater part of his life. He was born in A.D. 1114, and died in the seventy-third year of his age, after giving Latin versions of Galen's entire works, and of those published by the most popular Arabian physicians during the twelfth century.

‡ *Liber Pandectarum Medicinæ: omnia medicinæ simplicia cōtinēs quē ex cōibus antiquorum libris aggregauit eximius artiū et medicinæ doctor Mattheus Silvaticus: folio, Bononiæ,* 1480. Six editions, 1474, 1474, 1478, 1478, 1480, 1498, of this remarkable production were published during the first typographical century, and nearly as many afterwards: nevertheless, it is a book "of extreme rarity."—Matthew Silvaticus was patronized by Robert king of the Two Sicilies, who elevated the philosophical doctor to the office of court-physician. His object in composing his *Pandects* was to expound the Greek and Arabian "principles of healing" and thus to facilitate the study of medicine and its collateral branches. He was a native of Mantua: his death took place in A.D. 1340: his early history is not recorded. The early editions of this Treatise are without "pagination," but the author's alphabetical method promotes the ease of reference to particular articles. Under the head "*Euforbium,*" he epitomizes the opinions of Dioscorides, Serapion and Messué on its salutary qualities, and the records by Pliny concerning its discovery and original denomination.

‖ *Garten der Gesundheit; folio, Mentz,* 1485. This Herbal was composed by John Cuba, a physician at Mentz: it underwent frequent republications, obtained greatly diversified titles, and passed into versions in the chief European languages. From it were derived the *Hortus Sanitatis; folio, Moguntiæ,* 1492, and the *Grete Herball; folio, London,* 1516: its appearance gave rise to the order of herbalists, and thus became a principal foundation of modern botany. The medicinal properties of "*Euforbium een gomme*" are discussed in Chapter clxx of Cuba's original work.

§ *De Naturâ Stirpium libri tres, Joanne Ruellio authore; folio, Parisiis,* 1536,

Plants; by Mattioli* in his *Commentaries on Ancient Phytography;* by Dodoëns†, in his botanical *Pemptades;* and by their successors in cultivating the philosophy of vegetable nature.

p. 722—724. In his description of the Euphorbium and its medical uses, Book III, Chapter liii, the author follows Pliny, Dioscorides, Galen, and Paul of Ægina, without attempting to confirm their principles by facts deduced from his own experience.—Jean de la Ruelle, M.D. became Dean of the Medical Faculty in Paris and one of the king's physicians. As an editor and translator, the doctor so far excelled the co-eval scholars as to be designated by them the "*aigle des interprètes.*" He made Latin versions of the works of Dioscorides and Actuarius; he gave correct editions of Hippocrates, Galen, Euclid, Celsus and Pliny the naturalist; and, in approbation of his botanical merits, the *Ruellia* has been made a generic appellation in the Acanthaceous family of plants. This laborious phytologist was born at Soissons in 1474, and died at Paris in 1537, having become a widower and entered into holy orders, a short time before his decease.

* Mattioli's first botanical work was published in the vulgar tongue of his country, with the title *Il Dioscoride con gli suoi Discorsi, aggiuntovi il sesto libro degli antidoti contra tutti i veleni; folio, Venezia,* 1544. He afterwards gave it to the world in a Latin version—*Commentarii in sex libros Pedacii Dioscoridis, adjectis quàm plurimis Plantarum et Animalium iconibus; folio, Venetiis,* 1554. Under both these forms, his Commentaries appeared in numerous editions; and, under the superintendence of Dr. Caspar Bauhin, they constituted the chief portion of *Petri Andreæ Matthioli, M.D. Opera quæ extant omnia; folio, Basileæ,* 1598, 1674, *et folio, Venetiis,* 1712, 1744. At Book III, Chapter lxxx, p. 585—6 of the edition 1674, are the description and figure of the Euphorbia, with "considerations" on its discovery, its uses in medicine, and its appellations.—Pietro Andrea Mattioli, M.D. completed his education at the Italian schools; and, through the progress of a lengthened life, he enjoyed the respect which society intuitively concedes to a useful and dignified character. His botanical pursuits were crowned with eminent success, and his writings will remain an enduring memorial of his sagacity and indefatigable exertions. By his own industry and the devotion of his friends, he was enabled to describe many new vegetables; and, out of gratitude to the improvers of his favourite science, he restored the ancient custom of dedicating plants to the honour of illustrious phytologists. Yielding to the advances of old age, he renounced his office of physician at the emperor's court; and, retiring to the vale of Trent, he drew the solace of his declining days from the tranquillity of a rural seclusion. He was born in 1501, and died in 1577 from a seizure of the plague.

† *Cruydt Boeck van Rembertus Dodoneus volgens laetse verbetringe, met bijvoegsels achter elck capittel, ut verscheyden cruydt beschryvers; folio, Antwerp,* 1553. *Histoire des Plantes, contenant la description des herbes, leurs especes, noms, temperaments et vertus, traduite du bas Allemand* (of Dodonæus) *en François, par Charles de l'Ecluse; avec un discours sur les gommes, liqueurs qui découlent des arbres, et quelques bois, fruits et racines aromatiques; folio, Anvers,* 1557. *A Nievve Herball, or Historie of Plantes;* wherein is contayned the vvhole discourse and perfect description of all sorts of Herbes and Plantes:

Whatever might be the powers ascribed to Euphorbium after its earliest experimental administration as a remedy, there exists some reason for assuming that they would be regarded as real by Pliny and Dioscorides, when engaged in describing the kinds and properties of such herbs as had then been distinctly ascertained. With these writers, the latter being practically acquainted with the qualities of medicinal substances, the energies of this vegetable exudation are held to be available in the treatment of many different maladies; but, with the same writers, there is always the precaution, that these energies must be guarded in their activity by other ingredients exhibited with them, in combination. For more than eighteen centuries, and with immaterial variations, these views were transmitted through a long succession of naturalists and physicians, until the elementary principles of the Euphorbium were detected by scientific Chemistry, and their effects on the afflicted were disclosed by the sagacity of clinical Observation. Thus, as the drug's efficacy became better known, its employment was gradually discontinued, and it is now altogether without recommendation from any of the "Colleges." As an application for the removal of warts and excrescences, or for the discussion of swellings, it is sometimes preferred by fanciful or eccentric doctors; but, by the "reformed" rules of the Faculty, the forces of Euphorbium are too violent to be safely entrusted, for any reason, to popular management. On the evidence afforded by extensive observation of the results

first set foorth in the Almaigne tongue by D. Rembert Dodoens; and nowe first translated out of the French into English, by Henry Lyte, Esquyer; folio, London, 1578. Remberti Dodonæi, M.D. *Stirpium Historiæ Pemptades sex, sive Libri xxx folio, Antverpiæ*, 1583.—Malines was the birth-place of Dr. Rembert Dodoëns; he graduated at Louvain in 1535, and then visited the most eminent of the continental universities; he became physician to two emperors of Germany in succession; and, by the last of these, he was raised to the dignity of an "aulic councillor." At a late period of life, he obtained the professorship of medicine at Leyden where, in 1585, his decease occurred, in the sixty-seventh year of his age. Dodoëns stood high in the estimation of his cotemporaries, as a physician, a philologist, a rhetorician and a mathematician, but more especially as a phytographer: his celebrity has its memorial in the *Dodonæa*, a febrifuge aperient belonging, in some schemes, to the *Terebintaceous* family of vegetables. Through Lyte's version and Gerarde's selections, the *Pemptades* of Dodoëns contributed essentially, in England, to the development of a taste for botanical investigation.

[The preceding biographical and bibliological sketches have been appended to the present article, for the purpose of facilitating future reference: probably besides, they may not be unacceptable to those who find pleasure in such pursuits.]

produced by Euphorbium, and by varied analysis of its elements, this judgment has been pronounced by experienced physicians—"nous répétons que l'emploi interne de l' Euphorbe doit être banni de la saine médicine, et son usage externe fait avec une extrême prudence."

MELISSA *the Princess.*—Mythologists represent the deified Jupiter as having been fostered, amid the perils of his infancy, by the two daughters of Melissus one of the primeval Cretan kings. These princesses are designated Amalthæa and Melissa, in heroic story; and there too, their "philoprogenitive" piety stands recorded with due admiration and reverence. From a generous solicitude respecting the charge of their adoption, the young divinity received ample supplies of milk and honey: he prospered wondrously under the use of this rich as well as luscious aliment, wherein the best qualities of nectar and ambrosia reside, in their exquisite purity: it is the sweetest and the safest panacea,* and one of the surest also for prolonging the joyous vivacity of youth, and for resisting the infirmities which deprive old age of cheerfulness and comfort.

When their nursling had exalted himself to the "sovereignty over gods and men," these compassionate maidens were not left unrequited, for the tenderness of their affection. Amalthæa obtained a bright destiny from the Lord of Olympus himself, but he transferred to Botanists the sublimer duty of originating her sister's immortality; and, from them, she derived the deification which accorded her a shrine in the temple of Vegetable Nature. Thiswise runs their tale in legendary diction. While secluded on the Dictæan mountain with its flowery solitudes, the mysterious babe was entertained with milk of goats by Amalthæa, who discharged the self-assigned office of providing him with this very nutritive beverage; and, in gratitude for the faithfulness of this maternity, the god afterwards bestowed upon her an everlasting inheritance in the heavens, with its symbol *Capricorn* among the zodiacal constel-

* Pliny relates an anecdote confirmatory of this observation:—"As for honied wine, the best and the most wholesome is always that which is made of the oldest hard wine: it is very nutritive and breedeth good flesh. Many have held out a long time fresh and lusty in their old age, with the nourishment of honied wine alone without any other food. Of this, we have the notable example of Pollio Romulus who, being above an hundred years old, bare his age passing well: at this the Emperor Augustus marvelled much; and, being upon a time a guest at Pollio's house, he asked him what means he employed most so to maintain that fresh vigour both of body and mind. The reply was, *intus mulso, foris oleo*, by using honied wine within and oil without."—Dr. Holland's Pliny, *Book XXII, chap. xvii, Vol. II*, p. 136.

lations. Melissa had discovered a method of collecting and purifying honey, for alimental purposes; and, as she participated in her sister's concern for their extraordinary foster-child, she furnished him from her stores with abundance of delicious sustenance. For these acknowledged services, her meed and their memorial were determined by the devotion of naturalists: they consecrated the princess* to be queen of the bees by giving her name to the honey-making insect, and they honoured her still farther by enjoining the rule, that Melissa's herb should denominate the balmy vegetable on which the bee is fond of exercising its melliferous industry.

Melissa *the Plant.*—This is the Balm, one of the *labiated* family of vegetables, "a most natural order having the herbage usually aromatic, often bitter, always harmless." Most of the primitive phytologists, both poetical and medical, evince an acquaintance with "the fragrant Balm that lures the bee," in that they severally distinguish the plant by some appropriate term which commemorates the fair one's fame, in whose honour the insect and the flower were first denominated. From the ancients, a knowledge of the plant and its reputed properties was transmitted to the Arabian doctors; and, through their compositions, it descended successively to the modern herbalists and the physicians, who generally agree in communicating information as the fruit of varied experience, often less actual however than imaginary.

Balm with its citron-scented blossoms, has been immemorially considered the source of a fragrant principle peculiarly agreeable to the bee, and of a cordial energy adapted, by exhilarating the "heart of man," to relieve his mind from the miseries of nervousness and melancholy. With the other elements of his pastoral illustrations, Theocritus† introduces the "odoriferous balm" with its buds ever-grateful to the bee; and for its being an ingredient in his antidote to poisons and the venom of serpents, Nicander‡ com-

* By every appearance, the appellation Μελισσα *the bee*, and Μελισσοφυλλον *the bee-herb, Melissa's plant*, derived their originals from that of the Cretan princess, on account of her discovery of honey and its sources: from her own name being the same as her father's in the feminine form, an additional testimony may be entertained in favour of this construction.

† *Theocriti, Simmiæ, Moschi, Bionis et Musæi quæ extant, cum notis; accedunt Theognidis, Phocylidis, Pythagoræ, Solonis, aliorumque poemata gnomica; græcé et latiné*; 8vo, *Parisiis*, 1627.—Theocritus was a Sicilian, and flourished about the end of the third century before the christian era: his works were first printed in the original; *folio, Mediolini*, 1480: in his Idyls ϑ & ι, under the term Μελισσα, he speaks of the *Balm* and its fragrant emanations.

‡ *Nicandri Theriaca et Alexipharmaca, græcé et latiné, interprete Jo. Gorræo,*

mends the "herb which hinds and herdsmen call Μελιφυλλον, Μελισσαια, and Μελισσοβοτανον because the bees, allured by its honied fragrance, are wont to buzz around its blossoms." Amid the excellencies that adorn the delightful disquisition of Virgil* on the *admiranda levium spectacula rerum*, " with their heavenly honey and ambrosial dews," his picture of the unforgotten artifices employed immemorially by the peasants for the allurement of swarming bees to their destined hives, is extremely instructive and exceedingly beautiful. Into this, the Mellifluous Bard introduces the charm of Balm ; and thus it stands, in his descriptive song :—

"Lo ! from their cells when swarms through ether stream,
And float at noon along the liquid beam,
And on the breeze that rings beneath their flight,
Draw out in darkling clouds their airy height,
Mark, where they seek dark grove or crystal spring,
There the bruis'd *Balm* and wild cerinthé fling ;
And tinklings raise, till echo rings around,
And the great Mother's clashing cymbals sound :
Soon shall they haunt the medicated seat,
And to their chamber's inmost cells retreat."

M.D. apud ejusdem Gorræi Opera ; folio, Parisiis, 1622, *pp.* 9, 11, 27, 44. *Nicandri Theriaca et Alexipharmaca, græcè, latinè, et italicè, curante A. M. Bandinio ; 8vo, Florentiæ*, 1764 ; *pp.* 83, 97, 163, 186.—Nicander of Colophon was a grammarian and physician, and ultimately a priest of Apollo, at Claros where that god had a famous oracle. In his *Theriaca*, the poet describes the venomous animals, and the remedies for the effects of their bites; and, in his *Alexipharmaca*, he treats of poisons and their antidotes. His poems were first printed ; *folio, græcé, Venetiis*, 1499 : they afterwards passed into a Latin version by Adam Lonicer ; 4*to, Coloniæ*, 1531 ; into another by Jean de Gorris, M.D. 8*vo, Parisiis*, 1549 ; into another by James P. Estevé, M.D. 8*vo. Valentiæ*, 1552 ; and into another by Euricius Cordus, M.D. 8*vo, Francof. ad Mœnum*, 1552. They were translated under the name of Cordus, into German ; 8*vo, Marburgh*, 1532 ; and Jaques Grevin, M.D. rendered them into French verse ; 4*to, Anvers*, 1568.—At verse 677 of the *Theriaca*, the word μελλισσοβοτοις is adopted by Nicander, for the sake of his metre : the Nicandra, a South American bitter, belonging to the *Gentianeæ* family of vegetables, is dedicated to his memory.

* Virgil describes the proceedings usually adopted for the security of swarming bees, in his fourth Georgic, verses 58—66. See the English versions of Martyn, Warton, Stawell and Sotheby, with their notes and illustrations. Melisphyllum is used in this description instead of *Melissophyllum*, by contraction and from metrical necessity. Cerinthé is the honey-wort, " an herb in which the bees do take great delight, because of the sweetness of its flowers."—The Magna Mater, *the Great Mother*, called also Bona Dea, was Cybele the mother of the gods, at whose rites her priests used to make loud noises with brazen drums, cymbals, and other high-sounding instruments.

Dioscorides treats of the Balm with his accustomed brevity. He recommends a decoction or vinous infusion of the herb as a pleasant remedy for tooth-ache, and as a good wash for bracing the mouth and gums. Into the subject, however, Pliny* entered more largely: this is one of his observations:—"Touching Baulm, if bee-hives be rubbed all ouer and besmeared with the juice thereof, the bees will neuer away, for there is not a floure whereof they be more desirous and faine, than of it: and, in truth, looke in what garden there groweth abundance of this hearbe, the bees there when they swarme, will be soone intreated to tarie and not be hastie to wander far abroad. The Baulm is a most present remedy not onlie against their stings, but also of wespes, spiders, and scorpions." Modern bee-breeders need not despise these aphorisms, because they have become venerable for their antiquity.

Serapion ascribes important qualities to this vegetable. It is the property of Balm, he says,† to cause the mind and heart to become merry: to revive those who are fainting, and to prevent fits of swooning, especially such as occur during sleep and stop the motions of the pulse: to drive away all troublesome cares and thoughts: and to alleviate the oppressive feelings of peevishness, discontent and mental depression. This pathetic view of the Balm's enlivening influences enters into Avicenna's "spiritual creed," without hesitation or disconfidence; and, reckoning on the universality of its

* Dr. Holland's Pliny's *Natural History of the World;* Book XXI, Chap. xx, Vol. ii, p. 106.

† John Serapion: *Insignium Medicorum Volumen in quo continentur—Jo. Serapionis, Arabis, de Simplicibus Medicinis opus præclarum et ingens;—Averrhois de Iisdem liber eximius;—Rhasis filii Zachariæ de Eisdem opusculum perutile;—Incerti Autoris de Centaurâ libellus, hactenus Galeno inscriptus;—Dictionum Arabicarum juxta atque Latinarum index valde necessarius: in quorum emendatâ excusione nequid omnino desideraretur, Ottonis Brunfelsii singulari fide et diligentiâ cautum est; folio, Argentorati,* 1531.—Otto Brunfels, M.D. was a laborious and admirable scholar. In early life, he studied philosophy and theology; and, in due course, he became a monk. Afterwards he adopted the principles of the Protestant Reformers, and succeeded in making numerous converts to their doctrines. Finding his health incapable of sustaining the toils of his position, he renounced divinity; and, on graduating in medicine, he settled at Berne as a physician. He died in that city in 1534, leaving many excellent writings, the fruits of his extraordinary erudition and industry. His *Iatron*, *Onomasticon*, and *Herbarum Icones* are esteemed productions, both for their intrinsic value and for the importance conferred upon them as being "scarce books." Their author's celebrity is commemorated by the *Brunfelsia*, a generic appellation in the order Solaneæ which, from their fœtid and narcotic energy, were termed by Linnæus the *Luridæ* or gloomy tribe of plants.

truth, the active philanthropist might experience a gladdening comfort in expatiating on the advantages to be derived from the resource of aromatizing apartments with a balmy steam, as the most delicious antidote to the *ennui* which necessarily preys on the victims of idleness and frivolity. From the same eloquent physician,* come the additional doctrines; that Balm solaces the soul of man, and invigorates his vital energies, with its sweetness of smell, austereness of taste, and tenuity of parts; that, with these qualities also, it strengthens the inward bowels and organs, and thus facilitates the processes of digestion; that it removes the megrim and fulness of the brain; and that it possesses a power to expel melancholy vapours from the spirits and the blood which permeate the heart and arteries. These edifying revelations stand forth in the *Grete Herball*:† beneath a prime figure of the plant, the simpler says that "the Melisse hath grete vertu to waste and sprede humours, and that it is good agaynst hote and venymous apostumes, medled with grece and layde to them, and agaynst all aches yf it be layde to the sore placen ix dayes. The wyne that Melisse is sodē in is good to kepe one fro swownynge yf the cause be colde: yf it be sodē in wyne and oyle, and layde to boyles, it rypeth and softeneth them, and spredeth the hardnesse of the lyuer and mylte." Balm moreover bears the credit of a generous All-heal, in the *Garden of Health*‡ where Virgil's precepts for the guidance of bee-charming are approved and recommended. "When their hiues are rubbed with Balme," the herbalist avers, "it keepeth the bees together and causeth others to come to them. Seethe Balme," he adds, "in white wine, and drinke it iii or iiii mornings together, to purge the breast, to helpe the shortnesse of winde, to comfort the heart, to driue away dumpish heauinesse, to helpe the falling sicknesse and all other diseases."

* Avicenna; Ebn-Sina; he was surnamed *Scheikh-Reyes*, the prince of physicians. One of his tracts is entitled, *De Corde ejusque Facultatibus libellus, e traductione J. B. Bruyerini, M.D.* 8vo, *Lugduni*, 1559. "Auicenne sayth, that *hasyll nuttes increase the brayne.*" Now, this aphorism being true, it offers an instructive suggestion to the guardians of weaklings with light heads and little brains. When a tiny brain occasions imbecility, let its victim be regaled often and freely with *Hasyll-Nuttes*; and, in due time, he may have a big head with a large share of cleverness and virtue.

† *The Grete Herball*; Chapter ccxci; folio, London, 1526.

‡ William Langham, Practitioner in Physick:—*The Garden of Health*, conteyning the sundry rare and hidden vertues and properties of all kindes of Simples and Plants; 4to, London, 1579; p. 60. Here, receipts are given for the preparation of balme-tea, balme-ale and balme-wine, with instructions for using them effectually in the treatment of diseases.

Were these foregoing pictures of ancient wisdom admitted to a fair consideration, would they not prove inducements for the medical squires to renounce their rings and their segars and their hunters, for the purpose of devoting the refinements of their science to the culture of Balm and its Bees, as a pleasant pathway to Fortune —the pole-star of pure utilitarian philosophy? That honourable industry might attain a prize so coveted, and its happy consequences has been exemplified on authority delivered by the elder sages: that such a result would be certain from the powers of Balm in the "cure of all diseases," comes with high claims for a trial under the persuasive sanction of modern experience. Thus, by two eloquent pharmacological associates,* it is stated that Balm has its fragrance increased by the process of drying; whereas, with most other herbs, their odour is extinguished by desiccation. This plant imparts a bitter, somewhat hot, aromatic taste: its qualities are exhilarating, tonic, and carminative: it operates beneficially in hypochondriacal and dyspeptic affections, in low spirits proceeding from defective energy of the brain, and in complaints attended with derangement of the memory. These physicians themselves prescribe for apathetic fat old gentlemen, an infusion of balm, in liberal morning draughts; and this usually determines good effects when assisted with moderate exercise. This medicine also, they affirm from observation of its influences, exerts a benign and restorative efficacy in strengthening the constitution when broken by palsy, apoplexy, erratic gout, atrophy, chronic catarrh, rheumatic fever, and nervous excitement. Balm is a plant, they conclude, which naturally possesses a susceptibility of manifold applications—in tea, cakes, powder, syrup, beer, wine and essence—and it ought to be more generally administered, in medicine.—Let the Balm, then, be tended wisely and multiplied extensively by the prudent Herbalist, and he may derive a delicious and enlivening recompense from the fruits of his labour; for, as he may see, in the Melissa's essence reside the high-prized sources of health and comfort and longevity.

* F. V. Merat, M. D. and A. J. De Lens, M.D.—*Dictionnaire Universel de Matière Médicale et de Thérapeutique Générale; Tome iv, p. 266: 8vo, 4 tomes, à Paris, M.DCCC.XXXII.*

AN ESSAY ON THE NATIONAL CHARACTER OF THE ROMANS.

In a paper on the National Character of the Romans, it will be necessary, in the first place, to make a few brief observations on the origin and early history of their celebrated commonwealth.

It is not here intended to offer any remarks upon the subject of Roman history, but simply to write upon the national character of the people. The Romans may be said to have been the inventors of the science of politics—to have first laid down practical rules and maxims for national exertions—and to have set out, even when they were but a petty state, upon a system of which the conquest of the world was only the necessary consequence. In the present Essay, however, it is not exactly my business to concern myself with these matters.

It has been admirably observed by a modern historian, that "numberless are the events and the changes through which the Romans passed from one extreme to the opposite: vast destinies, mighty deeds, and men who were worthy to wield a gigantic power, have preserved the memory of much, in the history of Rome, even during the most ignorant ages. But, in the early part of it, Poetry has drawn her party-coloured veil over historical truth: afterwards vain fictions, still more frequently than popular legends, under various forms, are mixed up, within the outlines of dry chronicles, with the scanty results collected by one or two genuine historians from authentic sources. Often they are irreconcilable and easily discovered; but sometimes there is a deceitful congruity."* There can, indeed, be no doubt but, in the early history of Rome, poetry has done much, national vanity much, and individual credulity much, to embroider the plain fabric of truth with no inconsiderable proportion of embellishment. Still, however, from the nature of the pattern we may, perhaps, form an opinion as to the taste, not only of the embroiderers, but also of the public or community for whom their wares were originally fashioned. In other words, even if Niebuhr is perfectly correct, throughout the whole of those lectures in which he makes such unmerciful use of his pruning hook, yet from the character of the embellishments, or if you like it better, inventions, we may certainly form an opinion as to those qualities which were

* Hall and Thirlwall's *Niebuhr*, Vol. I, p. 1.

admired on the one hand and detested upon the other, by the Roman people.

If, for example, the wholy story of Mutius Scævola's visit to the tent of Porsenna were admitted to be a fiction, still it would, at all events, be certain that, at Rome, an exploit of such a character, whether it were in reality deserving of praise or not, would, at the time it was invented, have met with the highest applause. If the escape of Cloelia at the head of the female hostages and the honourable conduct of the consul Lartius in compelling them to return had no existence in truth, still there can be no doubt but that the Romans, at the period when this became a part of their history, were of a character to admire at once the dashing courage of the heroine, and the high-toned probity of the public officer.

The story, also, of Camillus, and of the treatment he bestowed upon the felon school-master of the Falisci, is another exquisitely beautiful trait in the national character and—finding, as we do, so little to admire—one upon which it is delightful to repose. It may be more or less established, for nothing, we are told, before the destruction of the archives in the Gallic war, is perfectly authentic. But the very fact of its being related in the way we find it, is sufficient to prove that, in those primitive ages, the republics of ancient Italy had a high notion of honour and a just estimate of what is truly noble.

At the same time, do not let us adopt a too elevated opinion of their ordinary conduct. It does not follow that all their actions were equally virtuous and noble, because, on this single occasion, they bestowed their unqualified praise on the behaviour of Camillus. Let us take the evidence thus afforded us exactly for what it is worth, and nothing more. It shows, indeed, that they were able to appreciate a virtuous action, and that is something—nay, a good deal—but it does not follow that the heroic conduct of Camillus was an average example, any more than that of the culprit school-master. If, indeed, it had, Camillus himself would not have been so speedily banished by his ungrateful countrymen.

Another anecdote of ancient days may, perhaps, illustrate, in some slight degree, this matter, and it may be related here, although to many readers it is doubtless familiar. Once, upon a time, we are told, when the Greeks were assembled at the celebration of the Olympic Games, and when the visitors from all the various states were seated in their proper places, there entered a venerable old man, who could not find a seat and who walked forward for some time, vainly seeking a bench upon which to rest himself. At

length, however, he approached the quarter occupied by the Spartans, and immediately all the younger men arose and offered him the choice of their seats. We are informed that, upon this, there was a sudden exclamation of applause throughout the whole assembly; and it might have been imagined that the Greeks in general were the best conducted persons in the world. But the old man, it appears, drew a much juster conclusion; for he remarked that "all the Grecians knew what was proper and becoming—but the Spartans alone practised it."

Perhaps it may not be amiss to observe in this place, that Numa, the legislator of Rome, was a philosopher among the Sabines; and that this people are commonly thought to have had no small acquaintance with the laws of Lycurgus. Filtered, however, through Numa's more philosophic mind, the Italian legislation was certainly an improvement on the severity of the Lacedemonian system.

To return: Rome was indeed destined to run a proud and triumphant career. If we cast a hasty glance over the whole history of ancient times, from the invention of letters to that great era of improvement the introduction of a pure and revealed religion, we shall find that as the sea receives into its vast basin the tributary streams that intersect the earth by which it is surrounded, so the history of Rome, like her own Mediterranean, swallows up that of every other ancient people, with whom her fortunes came in contact.

Of the history of Rome we have, alone, any definite idea. We see her commencing as a petty town, with a few surrounding acres for a territory: we see, also, her decline and approaching ruin, till, like a colossal image overthrown by its own weight, she falls in many vast and long-enduring fragments—for each became in itself a mighty kingdom. The history of Rome, therefore, alone is a complete work: it has a beginning, a middle, and an end: whilst of every other people the questions to be answered are little more than these, namely—from whence they sprung? what they did or produced? and at what period they became a part of the Roman empire? Need it be added, that we are here speaking only of those nations which possess any authentic annals?

The history of Rome, I repeat, is one connected book: whilst those of Babylon and Persia, of Egypt, and even Greece, are only episodes. We must not, however, imagine the authors and compilers of Roman history to have known all this. It would, indeed, be a curious inquiry, if we could ascertain what was the real impulsive principle which induced the celebrated historians of old to commence

their labours, having no, or scarcely any, previous model before them. If, however, there are any historians amongst them, into whose characters and feelings their own writings give us any insight whatever, these are undoubtedly Livy and Tacitus. Every page of their histories bears the most conclusive testimony to their own nobility of feeling, to their love of liberty, their attachment to the free institutions of their country. Yet the candid manner in which they relate the errors of democracy, the oligarchy, and the emperors are equally apparent. Livy, however, wrote when the liberties of Rome had no longer any existence; and Tacitus was born under the imperial despotism: neither of these authors, therefore, had ever breathed the air of freedom, or known anything of free institutions except merely as things that once had been. Livy was a bright ornament of the Augustan age; and was born about the time of the great battle of Philippi. Tacitus was, perhaps, the last of all the truly classical writers of Rome. They knew nothing, therefore, except by contrast, of Roman freedom; and yet these are the men who have left us the most valuable histories of their native land. It was because the Roman spirit so long survived the commonwealth.

The reasons that influenced the earlier and the greater of these historians are thus divided by the acute and indefatigable Niebuhr: "Livy wrote," observes that author, "because nature had endowed him not only with an admirable talent for narration, but also with a highly brilliant gift of seizing upon what is characteristic in humanity. He wanted only the command of, or rather, perhaps, a delight in metrical arrangement, to have had the genius of the poet." And surely this it is to write under the spontaneous inspiration of a natural genius: this it is to be an author of the first and most elevated rank!

"Livy wrote," continues Niebuhr, "equally without doubt or conviction, but with all the spirit of the marvellous and heroic ages. In domestic politics he had prepossessions which coloured, slightly, perhaps, his writings; although party spirit was already burnt out under the extinguisher applied by the imperial despotism. At the same time, we can scarcely believe Livy to have been a very laborious enquirer. Of distant countries he seems to have adopted the first account that came to hand. And surely, in his own time, amongst the ancient semi-fabulous tales which formed the materials —half poetical, half historical—of his Decades, he might, by more pains-taking, have furnished something more valuable, because more authentic."

In what spirit, then, did he compose his work? To my own taste, the question is best answered by the writer on Roman history whom I have already quoted:—"His wish was to forget the degeneracy of his own age whilst reviving the recollection of what had been glorious and excellent in former times. And the very security in which the weary world was beginning to breathe again (under the mild despotism of Augustus) could not but comfort him under his melancholy when he was delineating the fearful events of the civil wars. He desired to teach his countrymen to know and to admire the deeds of their ancestors, which had either been forgotten or were heard of only from unconnected narratives: and he bestowed upon their literature a colossal master-work, with which the Greeks have nothing whatever to compare, nor can any modern nation place a parallel work beside it. No loss that has befallen us, in Roman literature, is equal to that of the works of Livy which have perished."

Cicero distinctly gives the pre-eminence to the Greek historians: for which, indeed, he is strongly censured by Lord Bolingbroke, who, singular to say, forgets that Livy was no more than an infant, and Tacitus unborn, when the great light of Roman eloquence and philosophy was quenched under the second triumvirate. Had, however, Cicero lived, he would have had less to regret in the literature of his own language and nation.

It is to Livy, therefore, we must particularly apply for information as to the Roman character. But before we proceed to this inquiry, it will be requisite to say a few words upon the foundation of Rome and the origin of the people who afterwards arrived at so high a pitch of prosperity and splendour.

It is difficult to make anything of the contradictory fables connected with the foundation of Rome; but its first builders seem to have been a military body composed of restless spirits from other states, yet independent of all and unconnected exactly with any. At the same time we must confess their origin, so far as we are able to judge of it, was anything rather than reputable.

It would seem that Romulus had arrived at a considerable degree of power, as the leader of a new and motley collection of not by any means respectable persons. Very early befel the rape of the Sabine women, an act of violence by which he was enabled to procure wives for at least the more valuable and decent of his companions. By this, a war was excited, which, however, by the address and affection of the women themselves, who had become attached to their lords and masters—a circumstance, by the bye, which testifies

highly in favour of both parties—was brought to an amicable arrangement, and an incorporation took place between the new people, and a considerable accession of their Sabine connexions. The fortune of Romulus again prevailed, and he became sole king over the united nation.. The fruits of his many and successful wars were matured by the long and peaceful reign of Numa, a sovereign of the most consummate address and wisdom.

The effect of this prince's reign of forty peaceable years, was the firm establishment of a system of laws and customs, in which Religion—it is true of a superstitious character, but still one which exerted an amazing influence on the minds of the people—took a deep root in the still youthful state. It continued for a very extended period to exercise an almost absolute sway over the national character. Of this we have an example in Lucius Albinus, who, during his hasty flight from Rome, on the advance of the victorious Gauls, actually turned his own family and goods out of his carts, in order to take in the vestal virgins with the utensils employed in the sacred offices of religion. Albinus conveyed them in safety to a city called Cære, and from the circumstance of their continuing their religious customs in exile was derived, as we are taught to believe, the word "ceremony," so frequently used in every nation.

A succession of warlike kings extended the territory of Rome, whilst a military system amalgamated itself with the national superstition; but in a proportion, we may observe, much better fitted for practical and social purposes than that which afterwards lent so much force to the Saracen dynasty, under the Mahometan imposture. Proceeding gradually to the conquest of Italy, all the other tribes by which that peninsula was occupied merged at length in the name and designation of "Roman." It is remarkable that all the great masters of Poetry and Eloquence, in the Latin language, with the single exception of Julius Cæsar, were sprung from some other state or tribe than that of Rome: yet so exclusively Roman is the whole spirit of their literature that there is scarcely a vestige of the history of any one of the other states, excepting as it is reflected by that of Rome. The earlier glories, even of Etruria—a wealthy nation, and one which vied with Greece in the arts, even in her golden days—is entirely lost, and every thing in the language of Italy is Roman.

The gradual incorporation of state after state continued, until Italy was one united whole: and as long as there was a pressure from without—as long as Rome had enemies to contend with of sufficient force and power to stimulate her national spirit of patriotism—so long she was at peace within her own bosom—so long she

was not only formidable to her enemies, but her sons preserved the strong and leading features of their national character—so long, also, there was a tolerable security of property and person. It was only when she grew all-powerful that her own ambitious magnates, guiding—as superior talents and intelligence ever must—the mass of her democracy, wrought her so much evil. It was not long, however, before the same commonwealth which had consecrated the devotion of the Decii and held in veneration the virtues of the poor and incorruptible Fabricius, not only nursed in her bosom, but long continued to tolerate the political as well as private profligacy of a Cataline, and bowed in abject terror before the alternately successful bloodhounds Marius and Sylla. It was not much longer before the descendants of that people who had banished the heroic Lucullus for only presuming to yoke unto his triumphal chariot four milk-white steeds, submitted to a slavery fully as base and unqualified as any that had ever obtained in the regions of Eastern despotism, and under a line of emperors certainly amongst the most contemptible of their species.

What shall we say, then, was the national character of the Romans? We can only say that it was very different at different periods of their history. Let us compare the stern and uncompromising sense of public duty displayed by Junius Brutus, with the venality of the Jugurthine negociations. Let us compare the severe discipline of Manlius Torquatus with the revolt of Cæsar against the senate: and with the conspiracy of Cataline against every class and department of the state. In the Gallic war the people were still so deeply impressed with a sense of justice and religion, that it was debated whether or not Fabius ought to be given up to the barbarians, as a victim justly due to those deities who presided over the laws of nations; since, having been sent as ambassador, he had drawn his sword in battle. But how shortly afterwards had the Romans become the most unscrupulous of mankind, where the interest of their own country was concerned.

The following is the testimony borne by Polybius, a Greek, to the character of the Romans. He was the friend of Scipio, and wrote about the time of the second Punic war, or between that and the third. "They most inviolably keep their word," says Polybius, "without being obliged to it by bail, witness, or oath: whereas, ten securities, twenty promises, and twice as many witnesses cannot hinder the faithless Greeks from attempting to deceive and disappoint you." It was not long, however, before the Romans forfeited the title to any such eulogium as this.

Certainly there must have been an entire change in their national

character, between the age of Papirius and Camillus, of Fabricius and Curius, and that when Cataline and his accomplices disgraced the annals of Rome. Let us picture to ourselves a Roman senate, refusing to quit their seats on a mistaken but determined principle of honour when the town was actually taken by the Gauls, and when to remain was martyrdom. Let us imagine, at another period of the same republic, the senate on their seats, and listening in abject terror to the cries of thousands of citizens who were in the act of being murdered by the rampant vengeance of Sylla! In the one example they sacrificed their lives to a mistaken but truly sincere spirit of national honour: in the other they were too happy in purchasing their personal safety by a tacit, trembling acquiescence in scenes of the most lawless and horrible butchery.

Connected with this part of the subject, an observation may be made which is, in my opinion, of great weight and importance. Whilst the Roman character preserved its stern, but nevertheless noble elevation, the women were treated with a degree of respect of which we have but few parallels, if any, in ancient history. With the adoption of the oriental luxuries, this system was broken through; and I do not scruple to assign it as a cause, no less than as an effect, of the rapid demoralization of the Romans.

The women, at the moment when Romulus and the Sabines were about to sheath their swords in the hearts of each other, had saved Rome and reconciled their new to their old connexions. Thenceforward—as the tradition is—the matrons were esteemed to be an order of the most honourable kind. When the people were divided into three tribes, and each of these into ten curies, the latter were named after their respective matrons. And moreover, it may be interesting to some to know, that a married lady could never be compelled by her husband to do any household drudgery, if she did not like it. Spinning and weaving were supposed to be the proper departments of a matron. Every man was expected to give the precedence to a married woman: to insult her was a public offence. When the Roman had a right to sell even his children, to dispose in this manner of his wife was held a monstrous crime. There were only three legal grounds of divorce—adultery, attempts to poison his children, or counterfeiting her husband's keys—which is a singular equalling of what certainly appear to be very different offences. If a husband put his wife away for any other reason, she had certain exceedingly valuable claims upon his property. And it is remarkable, that the levity which crept in, at a later period, respecting these regulations, should have been the first beginning of

that corruption, the progress of which was so extremely rapid. It is certain, however, from all experience, that to weaken the sanctity of the marriage tie is to go very far towards the poisoning of all the springs of social virtue.

The national character was entirely changed between the age of Pyrrhus and that of Sylla; what, therefore, was the cause of this transition? In the first period Rome was weak in numbers; but she was strong in the heroism of her children. The sway of her commonwealth extended not over many distant provinces: on the contrary, the loss of a battle or two placed her very capital in danger of being taken. Her sons were, at this time, poor; but they attached little importance to wealth: witness the examples of Regulus, of Curius, and of Cincinnatus; and they felt themselves invincible in what they regarded as the fortunes of their city, but which, in fact, was their own self-denying virtue. Their superstition, however, supported their enthusiasm, and was, in its turn, the cause of their success; for it was chiefly this which preserved their virtue in its strict and uncompromising severity. When, however, this healthful circulation was impeded in the body politic, the fortitude and virtue of ancient Rome were lost and forfeited.

At the second period, Rome had become saturated with wealth; but it was not the wealth brought into a country by mercantile enterprise—an occupation which expands the heart and mind, brings men into contact with their own species, and convinces them that one rank is indispensably necessary to another. It was not the wealth produced by active and laborious industry, under the guidance of intelligence and ingenuity. It was wealth won alone by war and plunder; and as well might we expect the pirate or the bandit to sit down and enjoy his ill-obtained booty with the sobriety and discretion of an industrious artizan, as that wealth, won like that of Rome, should have failed to demoralise her people!

The Romans were now become too rich and luxurious to continue what they had formerly been, a nation of soldiers. A few soaring spirits, it is true, forsook luxury for the superior attractions of ambition. A universal genius, like Cæsar's, united every thing within itself, and shone in all alike superior. He was at once the first in literature, the first in arms, and the first in dissipation: we must not, however, forget that the age of Cæsar was also the age of Cataline: that his virtues were his own—his vices those of the times in which he lived.

With the monster Cataline, whose name I have just mentioned, it is, indeed, wonderful to think how many of the noble and digni-

fied in Rome were united! Even although his avowed aim and object were the downfall of their country; yet because, at this price, they hoped to purchase revenge against their enemies, an unrestrained license to plunder in a wealthy community, and an unlimited indulgence of every appetite and passion, many of the noblest of this degenerated city had their blood shed in that abominable conspiracy, by the hand of the public executioner! Evil, indeed, must have been, and must ever be, the aspect of affairs in that state where senators and public officers can unite with one denounced, in the most solemn manner, as the enemy of their country, simply for the accomplishment of their own private interest, or their own base and misplaced ambition!

The Romans, I repeat, though theirs was still a military state, were no longer what they had been—a nation of soldiers. Their legions were probably officered still, though not entirely so, by Italians; but the ranks were recruited from the athletic natives of many a conquered country. It was with an army trained in Roman discipline, but probably recruited in Gaul, that Cæsar fought his way to absolute power and dominion. The pay, the immunities, the license, and the *esprit du corps* of the Roman army, kept up its discipline, and therefore its valour, for ages and centuries after the liberties of the commonwealth had been offered upon the suppliant knees of the degenerate senate to every one, in turn, of the many successful adventurers who held the sword of victory suspended over the heads of its degraded members.

But from the period of the fall of Carthage the demoralisation of Rome was rapidly advancing. The Jugurthan war was another event which proves the celerity of her decay. It is notorious that Jugurtha bribed the executive government of Rome, patricians as well as plebians, to make a most iniquitous decree in his own favour and to the prejudice of the grandsons of Masinissa, the friend of Scipio and the faithful ally of Rome. It is Sallust who, relating the very words of Jugurtha upon that occasion, has stamped this indelible disgrace upon his country:—"O Rome!" exclaimed the African, as he turned his back upon the degenerate city of Fabricius, "how readily wouldst thou sell thyself, if there were only a purchaser rich enough to buy thee!" Can we believe this to be the same city in which the bribes of Pyrrhus had been scorned, and where the consul Curius had asked the ambassadors of the Samnites —scarcely raising his eyes from the turnips he was peeling for his supper—"what could the use of money be to one contented with such humble fare?"

The conquest of Spain, followed by that of Carthage, had introduced, not only wealth, but that which is really the poisonous characteristic of wealth—a love for it—into Rome. Gold was now their God, and they would do anything to obtain it. It is not sufficient, in order to corrupt the heart of man, that he should become rich: on the contrary, many have passed the ordeal, and their characters have justly risen from the trial. But only let a man be rich and make his riches an idol, he is indeed corrupted beyond all hope for the future. The sentiment is curiously expressed in the mad old play, *Hurtothrumbo*, wherein one of the fictitious worthies, Dologo Delmo by name, curses an enemy to the following effect:—"Lay on him the honey curse, the gilded pill, the bitter blessing, that, whilst it satisfies desire, infects the mind. Give him riches and make him love them."

The conquest of Spain, I repeat, with those of Sicily and Carthage, converted Rome from a poor state into a very rich one; and thus far tended to the demoralization of the national manners. Her eastern conquests completed the work of evil, for they not only increased her riches beyond every limit of moderation, but they introduced, likewise, every possible variety of vice and immorality. From this time we may date the complete dissolution of the old Roman character: nay, it would even appear as if the harder and sterner features which had distinguished her pristine fortitude and virtue served in this her second period to unite the most savage cruelty to every kind of vice, and thus still further to disgrace her.

In speaking, however, of the Roman character, there is one particular and independent testimony borne to it, which I am not aware that any historian of modern times has noticed. It occurs in or about what we may properly entitle the transition stage; that is to say, whilst Rome was in the act of prosecuting her Eastern conquests, or about a century and a half before the Christian era. I am referring to the 8th chapter of the Book of Maccabees, and the passage runs as follows:—"Now Judas had heard of the fame of the Romans, that they were mighty and valiant men and such as would lovingly accept all that joined themselves unto them, and make a league of amity with all that came unto them, and that they were men of great valour. It was told him also of their wars and noble acts which they had done amongst the Galatians. And how they had conquered them and brought them under tribute; and what they had done in the country of Spain, for the winning of the mines of the silver and gold which is there; and that by their *policy* and *patience* they had conquered all the place, though it

were very far from them; and the kings, also, that came against them from the uttermost parts of the earth till they had discomfited them and given them a great overthrow, so that the rest did give them tribute every year."

The narrative proceeds to state, in a still more circumstantial manner, their conquests in Asia Minor, Armenia, and Syria, as well as Greece; particularly specifying that the last named people were become servants to the Romans. After this it proceeds in the following language:—"But with their friends and such as relied upon them, they kept amity: and that they had conquered kingdoms both far and near, insomuch as all who heard of their name were afraid of them. Also, that whom they would help to a kingdom, they reigned; and whom again they would they displaced. Finally, that they were greatly exalted. Yet, for all this, none of them wore a crown or were clothed in purple, to be magnified thereby. Moreover, how they had made for themselves a senate house, wherein three hundred and twenty men sat in council daily, alway consulting for the people, to the end that they might be well ordered. And that they committed their government to one man every year, who ruled over all their country, and that all were obedient to that one, and that there was neither envy nor emulation among them."

In consequence of this flattering report, painted we must confess *couleur de rose*, yet not unlike in its general resemblance, the Jewish hero sent ambassadors to the great empress of the West, and entered into a close league with the Romans against Antiochus, the common enemy. If, however, we take this picture, allowing any fair degree of discount, and assume it to represent the position which the Romans occupied in the estimation of the nations by whom they were surrounded, we must confess that, up to this period—which is before the third Punic war—the virtue for which they were at first remarkable was not yet forfeited. How shortly afterwards they became corrupted, let Jugurtha, Marius, and Sylla—let the triumvirates—let Catiline—in short, let the pages of Sallust and Cicero, as well as Livy, testify!

In the later ages of Roman conquest, we find them still invincible, from their superior science in the art of war. We find the valour of their legions sweeping in the full career of victory towards the East, and overcoming also the hardier natives of the North in almost every encounter. But in their character and manners, we now find little less than unmixed, unmitigated evil. Cruel, sensual, tyrannical, and profligate towards the members of every other

state, they were pride and haughtiness personified; whilst at the same time they were accustomed to worship, in abject and slavish submission, monsters beneath humanity, which is no more than may be justly said of too many of their emperors.

Such was the degenerate character of Rome and her children. It is a disgusting picture, but not without instruction: for it may tend to render us grateful for the blessings we ourselves enjoy in a religion which has not only established private and social morality upon a firmer and more consistent basis, but has even purified to some considerable degree the international affairs of modern policy. This still, it is to be regretted, admits of many arts and artifices, which are not permitted to disgrace with impunity the walks of common life. There are still unblushing persons who distinguish between a public and a private conscience: but it is nevertheless certain, in these more enlightened times, that, in the end, it will destroy their influence and degrade their memory.

To sum up the whole, we must confess that, in the earlier ages of Rome, her sons had many virtues: that these were of a character rather stern than amiable is equally certain: but it cannot be denied that many distinguished qualities cast a glory on the Roman name, which in spite of many blemishes will endure for ever. Cruelty, nevertheless, mingled with almost every transaction. How few are their examples of clemency! how many and dreadful their acts of pitiless, cold-blooded, calculating barbarity!

Jugurtha, for example, was undoubtedly a monster of iniquity: but he was punished by the Romans, not for his crimes—for at these they had long connived—but merely for having resisted their authority. Perseus was at once wicked and contemptible. Was it, however, necessary, after plundering him of his wealth, and triumphing over his misfortunes by making him a part of the spectacle of their consul's triumphant entry, to starve the unhappy wretch to death in his prison? The fate of Tigranes, the once proud king of Armenia, was even more pitiable still. Defeated in several battles and sensible of the impossibility of offering any effectual resistance to the Roman arms, he repaired to the camp of Pompey, and in the most submissive manner laid his crown at the feet of his haughty invader, surrendering up himself and his people to the pleasure of the Romans. Pompey, it is true, received the king with an outward appearance of favour: but after walking in the triumph of that fortunate warrior, amidst a crowd of other captives of the highest rank, he was cast likewise into a dungeon, where we are told he perished by famine. There is something so utterly disgraceful in

this latter treatment of their captives; for, after all, it was probably parsimony which prompted it, if we knew the truth.

There are two circumstances which are particularly to be considered in the customs of the Roman nation, which cover them with eternal disgrace. *First*, that which has just been mentioned, of exhibiting the noblest of their prisoners in their triumphal spectacles, than which nothing can possibly be more cowardly and tyrannical. The *second*, is their compelling those of ordinary rank to butcher each other in the sanguinary sports of the amphitheatre. Let us imagine the brave, the noble, nay, even the members of an unhappy royal family, whose fate would have drawn tears from any noble enemy, exposed to that unnecessary degradation; let us imagine the young, the beautiful, the tender even of the softer sex exposed to the same indignity. We may, indeed, admit the valour of the Romans, but we must deny them every claim to the dignity of heroism.

On the other hand, what a people must it be whose national taste —unlike that of the Greeks who delighted in the drama or the athletic and at the same time bloodless games of the circus or the stadium; unlike the horse-races and other field sports of the English, and extending far beyond our most brutal amusements of bull-baiting, boxing, or cock-fighting; far exceeding in atrocity the bull-fights of the Spaniard—what a people, I repeat, must it be that could compel persons taken in open warfare to kill each other for public amusement! This, indeed, is horrible: but what a climax is it, as respects their national and social character, when we read that the young, the beautiful, and the most accomplished, even of the softer sex, hurried in crowds to these bloody scenes, and spoke of a skilful swordsman and his sanguinary feats as those of our day will of an opera dancer! Fancy this a national amusement, on which the spoils or tribute of a province were frequently expended, and which would at any moment win popularity to any wealthy personage in Rome: imagine all ages, all ranks, all sexes crowding the benches of an amphitheatre to the number of thirty thousand spectators, and all filled with the same enthusiasm! It is impossible to go beyond it: we must confess it is disgraceful to humanity. In fact, there is but one cheering ray in the remembrance of this strange and frightful custom: namely—that the first christian emperor of Rome put an end to it entirely.

In short, of the Romans, in every age, we are only able to say that, towards their enemies they were always cruel and vindictive: besides this, to their friends, when their own interest was concern-

ed, too frequently faithless and ungrateful: that their private morality was dubious and questionable at the best, and their public policy treacherous and unscrupulous: that their religion was only a tissue of superstition: and all this dark picture of their vices only relieved by that stern and heroic fortitude which, in their perverted view of the matter, was entitled virtue. The picture drawn by the Lady of the Lake of her Highland admirer, Roderick Dhu, may serve for the "National Character of the Romans":—

> "Wildly whilst their virtues gleam,
> They make their passions darker seem
> And flash across their spirit high,
> Like lightnings o'er the midnight sky!"

A POPULAR SKETCH OF THE GEOLOGY OF DERBYSHIRE.

By J. B. Jukes, B.A. F.G.S.

Should a geological reader cast his eye upon this title, I entreat him to pause, while I tell him that he will meet in this sketch with nothing he does not already know, since I have only been able, during this wintery spring, to snatch occasionally a few days of geological weather, in which to acquire just so much knowledge of the country as should enable me to understand what others may have written or said upon the subject. As, however, my object in these papers is not the putting forth original observations, but solely the popular explanation of what is already known, this hasty examination of Derbyshire will be sufficient, I hope, for my purpose. I address myself, then, to the reader who has not made geology his particular study: and in order to make myself intelligible to him, I shall not scruple to put down what may be a thrice told tale to the experienced geologist.

The county of Derby, in its southern parts, is blended with that of Leicester, and the geology of the two is so intimately connected that an account of the one necessarily involves much of that of the other. If we draw a line from Ashbourn to Derby, and continue it thence to Nottingham, we shall have marked out a very import-

ant and striking natural division of the district. Any one who has passed through the county and crossed this line, even on the top of a stage coach, must have been struck with the difference that exists in the aspect and character of the country to the north of it and that to the south. South of that line, the country is a complete plain—fertile and beautiful indeed, and frequently varied with gentle undulations—but, upon the whole, a broad level space, stretching east and west between the hills of Leicestershire on the one hand, and those of the north of Derbyshire on the other. Through this plain runs the river Trent, to meet which the Derwent, the Dove, and the Erewash, with their numerous tributaries, come gliding in from every side. In a level and cultivated tract, like this, where every bank is clothed with grass, and nothing deeper than a gravel-pit is anywhere visible, a man may pass his life without a thought of what lies beneath the soil he tills. If, however, we cross the line before mentioned, towards the north, the scene is quickly changed: the country becomes gradually bolder in its features, till we find ourselves at length winding among the deep and lovely valleys of the Peak, environed on every side by lofty hills. Here every one becomes a practical geologist, so far as the composition of the different rocks and their range at the surface goes; and no one, however unacquainted with the science he may be, can traverse the country without having the subject forced upon his mind. He will sometimes cross the high bleak moors of gritstone, dark with the foliage of the fern and the heather, or covered with long plantations of fir trees, where dreariness itself has something of grandeur from its very extent. From these he will look, on the one hand, over the coal district, composed for the most part of longitudinal ridges, furrowed by transverse valleys, frequently well wooded and, where not actually deformed by smokey chimneys and heaps of cinders and rubbish, containing many lovely spots. Turning his back upon the coalfield, and proceeding towards the limestone district, he will generally find the gritstone terminate in an abrupt descent, with a line of rough beetling crags overlooking a narrow fertile valley. On the opposite side of this valley, the hills rise with a smooth but sometimes steep ascent, to a height equal or superior to that on which he stands. This valley is composed of shale, and has most commonly a brook winding among a strip of lovely meadows, and the hills opposite are limestone, and on them is no heather, no fern, and but few trees; but they are clothed with a short light-green turf, and their outlines, though not peaked, are yet lighter and more delicately traced than the heavy lumpish

forms of the gritstone. But the chief beauties of the limestone district are its dales. The brooks and rivers run in narrow winding valleys, with precipitous walls of white limestone hung with the richest festoons of creepers, and from every ledge juts a dark yew or a bending ash, with thick woods of other trees on the green slope at the foot of the cliffs. The flashing waters of the brook as it foams over the ledges of rock that cross its path below, and the hoar cliffs that rear their heads into the sky above, form scenes to enchant the eye of the painter or the poet as well as to delight and instruct the mind of the geologist.*

Who, that thinks at all, can forbear inquiring into the reasons of the differences here pointed out? Why is it that, on one side of an almost straight and certainly a well-defined line, the country should be a perfect plane, and on the other a mass of hills? And what are the causes which have given to particular portions of this hilly tract, such definite and well-marked varieties of character? He who asks himself these questions has commenced the study of Geology; to answer them will be part of the business of this paper.

I shall begin them by briefly describing each of the different rocks or masses of materials of which the country is composed, their most remarkable characteristics, and the kind of organic remains they contain; and then consider the different positions they now occupy, and the effects of the moving forces that have placed them in those positions. The following are the different rocks or formations composing the district of Derbyshire, placed in the order in which they occur:—

AQUEOUS ROCKS.

1. Superficial accumulations, or diluvium

New red sandstone system—2. Red marls and gypsum

3. Red and white sandstone

* It has been said, indeed, that the study of Geology tends to blunt a man's mind as to his perception and appreciation of the beauties of Nature; that in studying the nature and origin of the rocks, the geologist is apt to lose sight of the picturesque beauty of the country they compose. This, however, appears as reasonable as to assert that we no longer feel the melody or harmony of a poem or a song when we understand the language in which it is composed. To the geologist, a beautiful country is not an unmeaning pageant, the recollection of which is but a fleeting dream; but a well defined and individual object which speaks to his intellect as well as to his eye. Like an artist before a masterly picture, he observes harmonies and beauties unseen by others, and to him every minute variation of outline or shade of colour has its definite meaning and appropriate place, all the parts combining to form a perfect whole that has a permanent station in his memory.

4. Magnesian limestone
5. Lower red sandstone.

Carboniferous system—6. Coal measures
7. Millstone grit
8. Limestone shale
9. Mountain limestone.

IGNEOUS ROCKS.

A basaltic rock, commonly called toadstone, is found associated with the mountain limestone.

SUPERFICIAL ACCUMULATIONS OR DILUVIUM.

In the northern part of the district, there is little that would come strictly under the term diluvium. There are proofs of great denudations having taken place, not only in the valleys which have been worn, as it were, in the solid rocks, but more extensively over large tracts of the more elevated surface. We know not, indeed, how we can avoid supposing the shale and gritstone, and possibly the coal measures, to have been once continuous over the district where now the limestone is at the surface: but the stripping off of these, and probably the denudation of parts of the limestone itself, belonged to periods far anterior to that in which was formed what we now term diluvium. Boulders of gritstone may occasionally be met with within the limestone district; but almost always in the valleys, where existing causes may possibly have carried them. The flanks of the hills, too, are sometimes covered with what the miners call clay and boulders; but this is generally the debris of the neighbouring hills, or the result of the decomposition of the rocks on which it rests. No pebbles that have travelled from a distance are ever found, so far as I am aware, on the hills of limestone or gritstone, or in the valleys among them. Boulders* of basalt or greenstone, however, may sometimes be seen in the coal district, which appear to have come from the north, as they differ in their mineral character from any of the rocks in the neighbourhood or to the south of it. On going south, however, towards the line of division before mentioned, we find an immense accumulation of diluvium piled over the comparatively low hills and covering the plain beyond. This diluvium is of several kinds. The hill at the back of Ashbourn church is composed, to a considerable depth, of red clay,

* Some of these were pointed out to me around Chesterfield, which were two or three feet in diameter, and differed decidedly from any basalt I ever saw in Derbyshire.

stuck full of pebbles of all shapes and sizes, driven pell mell together, without the slightest order or arrangement. These pebbles are almost wholly gritstone and limestone; and in some of the masses the calcareous matter has diffused itself sufficiently to bind the whole into a compact conglomerate, like that so often seen in the lower part of the new red sandstone.* It is, however, certainly a mere superficial diluvium, in which we can trace the action of the denuding forces that have brought down these ruins from the hilly region to the north. Over all the undulating country between Ashbourn and Derby, the diluvium consists for the most part of a light yellow sand, sometimes forming a soft sandstone and containing beds of pebbles. These pebbles are small, much rounded, and almost wholly quartz, a piece even of mountain limestone being rare. I never, among this gravel, too, could find or hear of any one finding a chalk flint. This is the more remarkable, because chalk flints, sometimes of large size, are scattered over the surface in considerable abundance† ; and boulders of mountain limestone may likewise be met with. These facts seem to point to two distinct periods of diluvial deposit, the quartzose gravel being the oldest. As we descend towards the valley of the Trent and the country becomes more level, this diluvium gets less and less sandy, till it is at last almost wholly a mass of quartz pebbles. These pebbles are firmly compacted together, seemingly by the pressure of the mass; a sharpish blow is required to detach one, when its shape is generally left in a thin matrix of fine sand, which fills up the interstices between the pebbles. An occasional bed of sandstone, some inches thick, also occurs, thinning out within a few yards, and the whole mass has a semi-stratified character, the pebbles lying horizontally in regular lines. This gravel may be seen at Morley Brook, three miles N. E. of Derby, whence it may be traced at some height on the flanks of the Derwent southwards to the Trent. In the Castlefields south of Derby, it contains more limestone pebbles than are seen in it elsewhere. On the right bank of the Trent it is very abundant, gravel-pits at Repton being thirty or forty feet deep in it with perpendicular walls like a stone quarry. Whence the immense

* On my first visit to this place, I was completely deceived into the belief that this hill was a new red sandstone conglomerate; and it was only on a second visit and seeing a larger portion exposed, that I perceived its diluvial character.

† About four miles south of Ashbourn, I one day found a chalk flint, containing a large inoceramus, one of the most characteristic shells of the chalk formation.

number of quartz pebbles can be derived is really a puzzling question. The majority of them are in every respect identical with those which, in Warwickshire and the neighbourhood, have been traced to the Lickey hill, and the levels of the country, which they seem to a certain degree to respect, would favour their transportation from that quarter; but they are certainly too abundant to have come wholly from that spot. Hartshill, near Atherstone, and probably some of the harder gritstones of the coal measures and new red sandstone, may have contributed their quota. In the south east corner of Derbyshire, and very abundantly about Chellaston, there is a diluvium of a different character; and this is the same as that in Leicestershire. It consists for the most part of rounded pieces of chalk and chalk-flints, and contains pebbles and fossils from the oolites and the lias, as also pebbles of coal. Boulders of mountain limestone also occur, but these are found occasionally lying on the surface over all the southern parts of the county, as are also the chalk flints. Pebbles of chalk, oolite, and lias are found nowhere, I believe, north or west of Chellaston. The state of these different materials has the same relation to the distance they have travelled as they have in the gravel of Leicestershire; but the most remarkable circumstance respecting them at Chellaston, is, that patches of this gravel are found interstratified, as it were, with the red marls and gypsum. In the plaster-pits near that place, there is thirty or forty feet of red marl exposed, resting on a thick mass of gypsum. The red marl is regularly bedded, perfectly horizontal, and contains regular bands of fibrous gypsum and lines of lenticular shaped masses of it lying in the plane of the beds, quite conformable to the gypsum below, and the whole, to all appearance forming one connected mass which was deposited without any breach of continuity. At various parts of the red marls, however, and frequently below the whole, on the thick bed of gypsum, lie patches of this gravel, a foot or two in thickness, containing pebbles and fossils of the lias, the oolites, and the chalk formations, all of which are of later date than the red marl itself. Notwithstanding the regularity of their appearance, therefore, it would be necessary to suppose this particular mass of red marls to be a redintegrated portion formed of the broken materials of other beds, and deposited along with the diluvium. While examining the materials thus singularly associated, however, one of the workmen mentioned the term "pot holes;" and on my enquiring what he meant, I found that over or near to one of these patches of gravel, there was frequently a "pot hole;" that is, a soft place in the marl, through

which the water came in from the surface, and in which, by "dabbling with a stick," the whole of the marl would tumble in, leaving a circular hole from two to eight feet in diameter, and extending from the gravel below either to the surface of the ground or to a mass of similar gravel above. It is evident, therefore, that it is to these "pot holes" that the presence of the gravel among the beds of marl is due, the holes either having a previous existence, or being themselves formed by the action of the waters* which brought the gravel into this part of the country.

The organic remains which may be considered proper to the diluvium, are those only of animals living during or just prior to the period when it was formed. Of these, I have not heard of any others but land animals. Remains of these were discovered in the Dream Cave, near Wirksworth, of which the reader will find a description in Dr. Buckland's *Reliquiæ Diluvianæ*. Some bones of the *Elephas primigenius*, or Mammoth, have likewise been discovered in the gravel near Derby, one of which is in the possession of Mr. Fearn of that place. A tusk, and a considerable number of the bones of the same animal were also found at a slight depth below the surface, in the cutting of the railway below Smithimore Bridge, in the valley of the Amber; but as they were in a very fragile state they were nearly all destroyed by the workmen, from whose sacrilegious hands the remainder were rescued by Mr. Milnes, of Stubbing Edge, near Ashover.

We will now consider all the superficial matters stripped off, and the regularly bedded rocks exposed to view, the uppermost of which are the rocks belonging to the

New Red Sandstone System.

This system or group of rocks is a very remarkable one in the Geology of England. It preserves certain characters throughout its course, almost invariably forming a comparatively level tract of beautifully fertile and well wooded country, its beds being nearly always horizontal, and its colour generally red. The composition, however, and structure of its parts, as also their thickness and extent, vary greatly in different portions of its range. It admits,

* It is not uncommon in brooks with rocky bottoms, to find small basins containing one or more pebbles, to which a whirling motion is communicated by the action of the current, continually increasing the size and depth of the basin: a similar action may possibly have produced these "pot holes."

on the whole of the four-fold division given before, its highest or superior portion being

2.—*The Red Marls and Gypsum.*

These, where they occur in Derbyshire, differ in no respect from their character in Leicestershire, except in the presence of the gravel before mentioned. The section at Chellaston is

	FEET.
Dark-brown marl with green stains and streaks, having many thin bands of fibrous gypsum and lenticular masses of it; thickness varying according to the surface of the ground, but generally.....	40
Marl, full of gypsum in intertangled veins	6
Hard gypsum without marl	14

The marl is indurated, and splits into small cubical lumps, as is often the case with the marls of this portion of the new red sandstone. It contains no fossils, so far as I am aware, except those belonging to the gravel before mentioned. The thickness of this formation in Derbyshire is probably not greater than 150 feet. Below it we find

3.—*The Red and White Sandstone.*

These likewise contain beds of marl in their upper portion, but of comparatively insignificant thickness, and having little or no gypsum. The sandstones vary in colour from a dark reddish-brown to a clear white, and in hardness from a good compact building stone to a friable sand. It has the same characters which distinguish this part of the formation in Leicestershire, Warwickshire, and Worcestershire. The beds of white sandstone form a considerable portion of the whole, but are variable in their thickness and extent, thinning out and then setting in again. In Derbyshire, however, there are nowhere any good sections exposed in this formation, owing to the levelness of the country it composes. The same cause prevents us giving even a guess as to the amount of its thickness in this county. I was not lucky enough to discover any fossils in this formation myself, but Mr. Meynell, of Tapton Grove, near Chesterfield, shewed me a portion of a calamite and fragments of other vegetable remains from a quarry near Langley, which agreed exactly with those found in this sandstone in Worcestershire. The appearance of the

sandstone itself was also precisely the same. Although, then, I have not seen the place myself, I have little doubt of its being in the upper part of this formation.

Near the borders of Nottinghamshire, at Sandiacre and Stapleford, there are some very thick beds of a dark red sandstone, containing lines of pebbles, which I believe to belong to the lower part of the red and white sandstones, but of which I am not yet certain. There are one or two hundred feet of them exposed, forming some rather bold hills. The stone is hard and coarse grained; but the pebbles are hardly in sufficient number to give the rock the name of a conglomerate.

The next rock in order below the red and white sandstones, is

4.—*The Magnesian Limestone.*

Like all the other portions of the new red sandstone, this rock, while it preserves some characters, varies greatly in others in different parts of its range. When it occurs in Derbyshire, it is in its upper parts a beautiful white freestone, sufficiently soft to be cut with a knife, with a sparkling crystalline texture like coarse-grained loaf sugar. This is its character at Streetly wood, where it is thick bedded and quarried to a considerable extent. In other places it is thick bedded, harder, and more compact, and of a light yellow or straw colour. Some portions, while preserving this light colour and compactness, are thin bedded and flaggy, and much jointed; others again are in coarse-grained rough flags of a brick-red colour. Its lower portions are generally yellowish-brown, sometimes flaggy, and sometimes occurring in very smooth regular beds about a foot in thickness, when it is quarried for building stone. Its lower parts likewise contain sometimes beds of carbonate of lime, of a dull blue colour. Few or no fossils are anywhere found in this formation in Derbyshire: when they do occur they consist of marine shells. The thickness of this rock probably exceeds 300 feet. Below it, is sometimes, but not always, seen

5.—*The Lower Red Sandstone.*

This lowest portion of the new red sandstone system is still more variable in its characters than any other part. Its general character is that of a hard compact stone of a light red colour. It is, however, sometimes a soft micaceous sandstone, sometimes contains beds of red marl, and sometimes is indistinguishable in appearance

from a coal-measure gritstone. Its thickness likewise varies from a few feet to two or three hundred, but in Derbyshire and Nottinghamshire it can never amount to so much. Its fossils are few, and when they do occur consist of coal plants.

The rocks which lie immediately* below those of the new red sandstone system, are a complicated and important mass of materials, which from one of their most useful products are termed the carboniferous group or system of rocks.

The Carboniferous Group

consists of limestone, shale, sandstone, coal, and ironstone, the disposition of which materials, when the group is examined generally, is very variable. In Derbyshire, however, and over the southern part of England, the order in which they occur is found sufficiently constant to admit of the subdivision of the group into distinct parts. This subdivision is, perhaps, most complete in Derbyshire itself, where we find that the coal is confined to the upper portion of the group, and the limestone to the lower, its middle parts being almost entirely shale and sandstone, or gritstone. In determining these divisions, however, we must always remember that there are no hard and well defined lines between them existing in nature, but that each portion passes into the other by almost insensible gradations. The positive places, then, of each of our division lines must be in a great measure arbitrary and determined by our convenience, following as near as possible those marked out by Nature.

Beginning with the highest portion of the group in Derbyshire, we should find a series which may be represented by the following list, in which the different sizes of the type represent the differences in the relative importance of the beds:

Shale
Coal
Shale, with ironstone
Coal

* The reader will always bear in mind that one rock may be below another in the geological series, but that the country formed of the lower rock will frequently be much higher above the level of the sea than the country formed of the upper rock. This is owing to the dip, or inclined position of the rocks, in consequence of which the same beds, which in one place form lofty hills, gradually sink, till in a few miles, perhaps, they plunge *under* others which form a low and level country.

Gritstone
Shale, with ironstone
Coal
Shale, with coal
Gritstone
Shale
Coal
Gritstone
Shale, with coal
Gritstone
Shale, with coal
Gritstone
Shale
Gritstone
Shale
Shale with limestone,
Limestone, with shale
Limestone.

The alternations, more especially of the upper part, are of course much more numerous than are marked here; but this will serve just to give a rough notion of the relative proportions of the different materials in the different parts of the series.

Upon examining the rocks composing this series over the whole district, and by attending, not only to the differences in the size of their masses, but to their other characters, we are enabled to institute four divisions in this complex group, which are those given before, (p. 223), and which will now be briefly described.

6—*The Coal Measures,*

are the upper portion of the carboniferous group, and consist of very numerous alternations of thick beds of shale (called, also, bind and clunch), sandstone or gritstone, coal, and ironstone. The shale is a slaty indurated argillaceous earth, varying in colour from light grey to black, and treads down when exposed to the weather into a soft unctuous clay. It lies in very thick beds, (each mass being generally but one bed, which is sometimes sixty feet thick), composed of very regular and almost innumerable laminæ, marking the gradual nature of its deposition. It is generally jointed, or divided by vertical planes, very regularly, the joints being some yards apart, frequently parallel to each other, and crossed by other similar ones

in certain directions. The shale commonly contains more or less ironstone, which either lies in it in regular beds, a few inches or a foot in thickness, or occurs in layers of balls or nodules, formed by the aggregation of the mineral particles, not unfrequently round a leaf or other organic body. These balls are frequently septarian, or traversed by cracks which have been filled up by spar, generally of carbonate of lime. The gritstones of the coal measures are generally a fine-grained sandstone, sometimes thick bedded, sometimes splitting into large flags with beautifully smooth surfaces. These gritstones vary much in hardness and quality, being sometimes a good freestone, sometimes a hard stone with a ragged fracture, (called cank), only fit for mending roads, and sometimes they pass insensibly into shale and decompose rapidly by the action of the atmosphere. The gritstones frequently form continuous masses 60 or 80 feet in thickness. The joints of the gritstone vary with the character of the stone, being most regular in that which is thin bedded and fine grained. The different coal seams of Derbyshire, not only vary greatly in quality, but the same bed is frequently very different in different parts of the country. They are sometimes hard bright coals, being got in large blocks with smooth shining surfaces, sometimes soft and crumbly, forming what are called caking coals. From this great variety in the quality results the great advantage of having coals in the district suited to all uses, from those calculated for use in the drawing-room to others which are only fitted and are best adapted for the furnace or the forge. The vertical divisional planes of the coal beds in Derbyshire, which are there called slines, and which nearly answer to the joints of other rocks, follow the same remarkable law which they are found to do in other places, and run about magnetic N. and S.* The number of workable coals in Derbyshire is considerable, amounting to at least fifteen or sixteen beds; but for want of a general system of nomenclature, it is very difficult to trace these across the country, or to identify them in different localities, since the names given to the beds in one place are unknown in another only a few miles distant. There are five or six beds which are from four to six feet in thickness; one seam over the south part of the district is nine feet thick, but it is probably there composed of two beds; and there are many others which vary in thickness from three or four feet to as many inches. Each bed commonly preserves its thickness over a very wide area,

* The miners are often fully aware of this universality in the direction of what is called, in different places, the sline; for, in answer to my question, one of the workmen told me that the cleet or the face of the coal "faced two o'clock sun, like as it does all over the world as I ever heard on."

and the distance between each bed of coal is pretty much the same in one part as in another. The beds, however, of shale and grit which lie between the coal seams are very irregular in their extent: a bed of gritstone, perhaps, which in one place is of great thickness and occupies almost the whole space detween two particular beds of coal, shall in another a few miles distant be found to have thinned out to a few feet and its place to be almost entirely occupied by shale. This regularity and constancy over a wide area in a thin bed of coal, and the irregular thickening and thinning out of the shale and grits, evidently points to a difference in the conditions of their deposition. The coals seem to have been deposited during a period of tranquillity, in which the vegetable matter had time to diffuse itself equally over the whole space occupied by the water which contained it, while the shale and grits were swept in by currents which piled one material in one place and left another bare to be occupied by another material brought in perhaps by a different current.

This irregularity in the different beds is only apparent when they are traced over a great extent of country: locally they are regular enough; and we find the gritstones forming at the surface longitudinal ridges (running about north and south) on which the soil is light and fertile, with valleys or flat lands of shale, where it is frequently, cold and barren.* These cold and barren spots can often be improved only by thorough draining, and this the miner most effectually performs; and by carefully preserving the vegetable soil and respreading it when he has passed through the ground, tracts of land are often rendered fertile which by any less efficient process would always have been unproductive. This necessary precaution is in other places too often neglected.

The total thickness of the coal measures in Derbyshire is very great, certainly not less than 2,000 feet, of which about sixty-five feet consist of coal disposed in many beds. So that if we could see the whole exposed in one great cliff, we should see a huge mass of shales and sandstones, in which the coals would shew like thin black seams or streaks, or as dark partings between the thickened beds of the other materials.

As we descend† towards the lower part of the coal measures, we

* No coal field with which I am acquainted can compare with that of Derbyshire, for the pleasantness of its aspect, owing to the many ridges of gritstone.

† As far as regards the level of the country, this would be ascending; as where the lower portions of the coal measures come out to the surface, they form much higher ground generally than the upper portion.

find the gritstones become more numerous and thicker, until they assume the appearance of a mass of gritstones, between certain beds of which occurs sometimes a bed of shale containing a thin bed of coal. To this mass of gritstones is applied the term of

7.—*The Millstone Grit.*

This name of the millstone grit, (the derivation of which is sufficiently obvious), is applied by the Derbyshire coal and iron owners solely to the lowest bed of grit in the district, which is certainly the thickest and most important; and this is the sense in which the word is used by Farey, and in which it must continue locally to be received. There are, however, several beds of grit above this, which cannot be distinguished from it by any character except that of position, and which unite with it to form the remarkable and decided country of the Moorlands. These beds taken together constitute a well-marked division of the series, having peculiar features both as to the kind of country it composes and its other characters, which would be left without any common designation unless that of the millstone grit be extended to it. This extension accords both with the system of nomenclature adopted by geologists and with actual fact, since millstones are got from all these beds of gritstone indiscriminately. As far as I have seen of the country, I should think that the four first gritstones of Farey (he reckons from the bottom) would enter into this group; and the millstone grit would then consist of

1. Gritstone
2. Shale with a bed of coal
3. Gritstone
4. Shale with a poor band of coal
5. Gritstone
6. Shale with a coal smut
7. Gritstone, called by Farey first or millstone grit.*

We thus get a peculiar and important group clearly marked out, and give to this division of the series a greater equality with the others; and we render more intelligible the occurrence of several

* Coal and shale occur both in the millstone grit of Yorkshire and below it: we shall then by this plan have the group consistent throughout, and it is the nomenclature always adopted by geologists.—See Phillip's Geology, in Lardner's *Cabinet Cyclopædia*, Vol. I, p. 155.

detached portions of coal which are found separated from the regular coal district, more especially the coal which is worked at Alderwasley, which lies, I believe, between the third and fourth gritstones of Farey, and is, I am informed, the same as the Alton coal, which certainly occupies that position near Ashover. The gritstones of this group vary, in different portions of the same bed, from a coarse conglomerate of small clear quartz pebbles, to an almost fine grained sandstone. Many portions are hard enough for millstones, and almost all of them make an excellent material for railway blocks and similar purposes. They are thick bedded universally; and sometimes so much so that, for this reason and on account of the oblique lamination so prevalent in all sandstones, it is very difficult even in large quarries to discover the real bedding and dip of the rock. The oblique lamination shows, probably, the action of strong currents, which depositing successive layers of sand on the side of a slope, have caused the lamina of a bed to incline at a considerable angle in one or more directions, while the bed itself, which is made up of these lamina, may be horizontal or dip in another direction. The thickness of the lowest grit, or that which is known in the country as the millstone grit, being upwards of two hundred feet, it is probable that the thickness of the rocks which are here classed as the millstone grit group would be between four and five hundred feet.

Organic Remains of the Coal Measures and Millstone Grit.

These are both animal and vegetable, by far the greater portion belonging to the latter class. The animal remains consist of shells and fish. In some of the bands of ironstone, and occasionally in the shales, there are found a great number of bivalve shells, which, as they belong to the genus Unio, must have lived in freshwater. There are several species, of some of which the individuals occur in the greatest abundance, and are sometimes beautifully perfect and well-preserved. On splitting open the masses of black shale which lie upon the coal, and which may be found around a newly-sunk shaft, teeth and scales of fish, as well as fragments of their bones, may be found*, similar to those which are contained in other coal-fields. The fish of the carboniferous system have been shown by

* Mr. Atkinson, of Chesterfield pointed out the occurrence of these fossils to me in the neighbourhood of that town.

M. Agassiz to have been of a very remarkable kind, having many of the characters of a saurian reptile, whence they have been called Sauroid fishes. Some of the teeth found near Chesterfield are conical and striated, more like those of an Ichthyosaurus than the flat teeth common to fish: others, however, are palatal teeth, similar to those found in the chalk, but differing from them in form and markings.

The vegetable remains of the coal measures are far too numerous and form too complicated a subject to enter upon in this sketch. I must, therefore, refer my readers to Lindley and Hutton's *Fossil Flora* for a general description and figures of coal plants, and content myself with saying that the vegetable remains of the Derbyshire coal measures do not differ from those of other coal fields. Many parts of the district seem very barren in fossils; in others these are abundant. The genus *Calamites* is common, *Lepidodendron* not unfrequent, but *Stigmaria* and *Sigillaria* seem more rare than usual, neither is there that abundance of beautiful fern leaves which may be seen in some places, especially in the Ashby coal field, as described in Mammatt's *Geological Facts*. The truth is, however, that sufficient attention has not yet been bestowed upon the district; and there is no doubt it would amply reward the perseverance of local collectors, whose labours we hope will ere long be devoted to it.

8.—*The Limestone Shale*

Is the next group in order below the millstone grit. This is for the most part an immense mass of shale: in its upper portions, however, it frequently contains beds of gritstone, and in its lower, beds of limestone, showing a passage by insensible gradations into the rocks above and below it. This shale does not differ in character or appearance from many of the shales of the coal measures; it is, however, more universally black, and it stands exposure to the weather for a much longer time than the generality of the coal shales. It splits commonly into remarkably thin laminæ, contains many ironstone balls, and sulphur may frequently be seen in its crevices or lying in it in streaks and patches. The water which runs through it is generally ferruginous. Its thickness appears to be variable, the average being probably five or six hundred feet. In the southern part of its range, however, it occupies a wide surface, and here it probably becomes thicker. It contains here, in its lower portions, many beds of limestone, which may be seen to advan-

tage at Turnditch, and at Agnis Meadow, near Kniveton. At Turnditch lime quarries, there are forty feet exposed, consisting of alternations of shale and limestone in beds varying from three inches to three feet in thickness. The limestone is very hard, rather crystalline, dark coloured internally, but light brown outside. Its external appearance, when exposed to the weather, is at a little distance more like gritstone, and the weathered blocks are marked by horizontal lines, showing an original lamination. Sometimes this lamination is apparent, and the block will split into flags. Beds of this kind, I believe, exist at Ashford, near Bakewell; and I observed a bed of dark limestone, one foot thick, in the limestone shale which forms the bed of the brook just above Breadsall, two miles north east of Derby.

The beds of limestone in the shale increase in number and importance, I believe, as the formation passes westward into Staffordshire: but I shall leave the further discussion of this point till I come to speak of the positions and dislocations of the rocks, which in this formation are very interesting.

9.—*The Mountain Limestone.*

This, the most interesting and, next to the coal measures, the most important formation in the district, is so named from its frequently forming a hilly and mountainous country. The name is not a good one, as other limestones may equally form mountainous countries: but as the whole nomenclature of Geology is at present provisional, it is better to retain the old and generally understood names, as far as possible, till a regular system of classification and nomenclature can be constructed. By far the principal mass of the mountain limestone is composed of carbonate of lime, sometimes in rather thin and regular beds, sometimes in beds so thick and irregular as almost to defy the detection of the dip (or inclination) of the rock, unless a very large section be exposed. Among the beds of carbonate of lime, are sometimes found portions which contain magnesia in considerable abundance; and in some parts of the limestone district there is a thick and important formation, called "dunstone," which I believe to be magnesian limestone. The bedding of this is often obscure; but in some places, as on Middleton Moor, near Wirksworth, the lines of stratification are very apparent. In the upper beds of the mountain limestone, there is frequently a considerable quantity of silex, in the form of chert. This occurs sometimes in beds, as in the quarries near Bakewell, where a bed of

chert, six or seven feet thick, is quarried to be sent to the china manufactories in Staffordshire. Chert, however, most usually occurs in nodules and irregular masses distributed in the beds of limestones or in thin plates in the interstices between them, and in these conditions precisely resembles the flints in the chalk formation, of which the geologist is instantly and most strikingly reminded by many small cliffs in the upper part of the mountain limestone. If the chalk were indurated to the texture of the mountain limestone, no one could perceive the difference, except from the organic remains.* The thickness of the mountain limestone is certainly very great, but as the base of the formation is nowhere exposed in Derbyshire, notwithstanding the deep valleys and dales which have been scooped out of it, its entire thickness is unknown. Neither is it at present ascertained what is the thickness of those parts which are exposed; and this point is one beset with many difficulties. It is obvious that where we get a thick formation composed of many beds of the same material, and there is no section or pit deep enough to ascertain its thickness at any one point, but we are obliged to measure the different beds at many different places wherever we can find them exposed, the operation is one not only of great labour and difficulty, but liable to many errors. If all the beds were limestone, with no other material between them, it would be next to impossible to ascertain the whole thickness correctly. This, however, is luckily not the case, since thin partings of clay are sometimes found, seldom more than a few inches in thickness, and sometimes only half an inch; but occurring apparently between the same beds with considerable regularity over tolerably wide areas. These partings will probably be of great use eventually in working out the geology of the limestone. But the most important division of the mountain limestone is produced by the presence in it of a rock entirely different, not only from the limestone itself, but from all the others which we have hitherto met with. This is,

* This fact, and that of a tertiary limestone in the south of France containing nodules of flint similar to the chalk, (as described by Mr. Lyell), are remarkable, as showing us how accurately the same effects have been produced by Nature, when working under similar conditions, in æras so remote from each other as those of the production of the mountain limestone, the chalk, and the tertiary strata. From the similarity of the effects we may argue directly to the identity of the cause.

The Toadstone.

The toadstone is a basaltic* rock which in its dark colour and its sometimes spotted appearance is supposed to resemble the back of a toad; whence its name. It varies greatly in character and appearance, being sometimes a hard compact basalt, perfectly black, and homogeneous in its structure; sometimes a light cellular stone of a brown colour, the cells being filled with crystals of zeolite, mesotype, agates, or other minerals. Upon exposure to the weather these substances sometimes decompose and fall out, when the toadstone assumes exactly the appearance of a scoriaceous lava. It is never stratified, but is often jointed in all directions, and is sometimes laminated. It frequently has a tendency to decompose into balls, but never assumes anything like a decided columnar structure. The thickness of the toadstone varies from eighty to upwards of three hundred feet.† Its upper and *lower* surface is almost invariably covered by, or *rests upon*, several feet of a greenish yellow clay, which frequently contains balls and lumps of toadstone, and which is apparently the result of the decomposition of the bed. That this is the case seems to be proved by the condition of the limestone that rests upon it, which is frequently conformable to the uneven surface of the toadstone clay. In the Wheal's Rake mine‡ in Lathkill Dale, the lower bed of a mass of Limestone is seen resting on a thick mass of toadstone clay, which passes downwards into toadstone. The upper surface of this clay is very uneven, being all knolls and hollows; and from its soft nature it falls down in places into the workings, and leaves exposed the under surface of the limestone. This under surface is just as uneven as that of the clay, and indeed exactly fitted on to it, containing hollows two or three feet deep and the same distance across, out of which a mass of clay has fallen, or protuberances fitting into hollows of the clay, and com-

* Basalt or trap is one of that numerous class of rocks which are known to be the product of heat, or to have cooled down to their present condition from a state of fusion.

† In the valley of Ashover, I was informed by Mr. Milnes, of Stubbing Edge, that they had sunk in 1788, at the Townstead shaft, 375 feet in the toadstone, and then bored thirty or forty feet without getting through it. In other parts of the same valley, however, it is much thinner, being only two hundred feet thick at a shaft about three hundred yards distant from the former.

‡ I am indebted to Mr. J. Barker, of Bakewell, for a sight of these mines, and for much valuable information respecting them and the district in general.

pletely conveying the idea of the limestone having been deposited on the rough uneven surface of what must have been at that time solid toadstone, and which has since decomposed into clay. The toadstone has undoubtedly not been injected into the limestone, but poured out as a lava current on the bed of the ocean in which the mountain limestone was deposited.

We now come to the important question of the number of parts into which the mountain limestone is divided by the toadstone, or, in other words, the number of the beds of toadstone existing in this formation. Farey and the old geologists, in examining the country, found the toadstone bassetting or coming out to the surface in many places, in the sides of valleys or at the tops of hills, and finally agreed that there were three distinct beds, separated from each other by two beds of limestone, and having limestone above and below them; thus making four limestone and three toadstone beds. Mr. Hopkins, however, of St. Peter's College, Cambridge, after a very laborious examination of the district, has shewn (in a pamphlet to which, I am sorry to say, I cannot refer my readers, as it was only printed for private circulation) that this conclusion is by no means warranted by the facts of the case; but that these, when thoroughly investigated and followed out into all their consequences, prove the existence of only one *known* toadstone bed over by far the greater portion of the district. This one bed, together with the limestone above and below it, is so fractured by faults in different directions, as to have different portions of it brought up in various places, thus producing the deceptive appearance of several beds. Since Mr. Hopkins's examination of the country, however, it has been proved, by sinkings in one perpendicular shaft, that over a part of the district there are two beds of toadstone, as the following sections show:—

Wheals Rake Mine.

1st Limestone	57 feet
1st Toadstone	84
2nd Limestone	48
2nd Toadstone	9 and more.

The thickness of the second toadstone here is unknown, as the workings have not been continued to a greater depth.

Hungher Hill Mines, near Snitterton.

1st Limestone				21 feet.
1st Toadstone				84
2nd Limestone	Limestone	72ft.	0in.	
	Three clays	0	6	
	Limestone	36	0	
	Clay	0	2	
	Limestone	12	3	120
2nd Toadstone	reached, but not pierced through.*			

To these proofs may be added, the toadstone beds seen in Lathkill Dale and at Fin Copt Hill, and left uncertain by Mr. Hopkins, and probably, also, the beds seen in the High Tor and at Masson Lowe, near Matlock. When, however, we come to the question of the thickness of these different portions of the limestone, we again seem environed by difficulties. At Ashover, the whole distance between the bottom of the shale and the top of the toadstone, as seen in the shafts of the Gregory mine, is not more than 180 feet; and in Matlock High Tor and other points of the eastern boundary of the limestone district, where the whole thickness of the first limestone must be visible, it does not seem to be much more. At Tideswell Moor, however, Mr. Hopkins mentions a sinking in the first limestone of 600 feet without reaching the toadstone, and estimates the depth of the toadstone at a similar rate in the district around Monyash and north of Middleton Moor, by Wirksworth, and other places. Even, therefore, if we suppose with him, (and which probably is the case) that the first toadstone of the east part of the district thins out towards the west, and its place is occupied by limestone, there still seems a great irregularity in the thickness of the upper part of the limestone formation, in different parts of the district. Of the thickness† of the lower part of the mountain lime-

* My friend, Mr. Alsop, of Darley Dale, informs me that, a few yards further on, this second bed has been sunk through, and its thickness ascertained to be 108 feet.

† If, in the south east part of the district, we estimate the beds as follows:

1st Limestone	200 feet
1st Toadstone	90
2nd Limestone	120
	410

we shall get 410 feet as the extreme thickness which the first limestone ought to have over that part of the district where there is only one toad-

stone, in Derbyshire, nothing, as I said before, can be known, as but little of it is anywhere visible. Professor Phillips, however, does not assign a greater general thickness than from 500 to 1500 feet for this formation: it is probable, therefore, that more than half the whole thickness of the mass may be seen in one part or other of the Derbyshire district.

The most valuable product of the mountain limestone is lead ore. This is found in veins, which are of two kinds, technically called "rake veins" and "pipe veins." Rake veins may be best understood by conceiving a vertical, or nearly vertical, fissure in the limestone, varying in width from a few inches to three or four yards, and running in a directly straight line across the country, sometimes for several miles. This fissure is filled with spar of various minerals, and contains galena, or sulphuret of lead, either in detached cubical crystals, or more commonly in great "ribs" in the spar. Pipe veins are similar masses of spar and lead lying between the beds of limestone, but they are generally connected more or less directly with rake veins, or with great hollows and caverns in the solid limestone. The rake veins run in certain directions, and have others crossing them more or less nearly at right angles, and are ultimately connected, as we shall see hereafter, with the dislocations of the rocks. Where two rake veins cross, or where a rake vein meets a pipe, the ore is generally very abundant. It is a remarkable fact, that, on tracing a rake vein down to the toadstone, that rock is found to interrupt it, and it was for a long time supposed that the toadstone entirely "cut off the vein." It is now known, however, that on piercing the toadstone the same vein may be regained, and that it is frequently richer* than it was above. Veins of spar, called "leaders" may be traced through the toadstone; and in some instances a lead vein has been worked for as much as ten yards into the toadstone itself. This, however, is very rare.

Organic Remains of the Mountain Limestone.

These are, in some parts, very abundant, but belong almost wholly to marine animals. Some plants and leaves may occasion-

stone. It is possible that the difference may be caused by the inclination of the beds, which would, in a perpendicular shaft, increase their apparent thickness.

* A notion prevails (whether well or ill founded I cannot say) in Derbyshire, that no vein is *very* rich till it gets covered either by shale, clay, or toadstone.

ally be found in the limestone shale, similar to those of the coal measures. I have seen a few from the limestone beds in the lower part of the shale at Turnditch and Ashford. The marine remains consist of Corals, Crinoidea, Crustacea, shells, and fishes' teeth. The Corals are very abundant in particular places, and are frequently preserved with the utmost beauty, looking as perfect as if fresh from our own seas. *Tubipora, Syringopora, Turbinolia, Cyathophyllum* are among the most common genera. There are many, however, which have not yet been accurately figured or described, and with whose names and affinities I am unacquainted. The Crinoidea occur in particular beds in the most enormous abundance, and are well known from the sections of their stems producing the remarkable figures in the encrinal or Derbyshire marble. Rocks, many yards in thickness, are in some places literally composed of the fragments of the stems of these animals; and what is remarkable is, that while millions of stems may be seen, it is rare to find even a fragment of a head. In the neighbourhood of Ashford, however, the heads seem more abundant. Many genera of these animals are found; but for figures and descriptions of those peculiar to the mountain limestone, as well as of the fossils of that formation generally, the reader must consult Professor Phillips's *Illustrations of the Geology of Yorkshire*, Vol. II. The Crustacea consist of Trilobites, (of a different species from those of Dudley), many of which are found in the black marble at Ashford* and its accompanying rotten-stone. The shells of the mountain limestone are, I believe, wholly marine, and are of many genera and species. In the quarry at Turnditch may be found one or two species of a bivalve, which I believe to be a Posidonia, as also, both there and at Ashford, Orbicula, Lingula, and other remarkable shells. The most common and characteristic bivalves are the Producta, many species, varying in size from that of a nut to that of a man's head, lying in the rock, sometimes, like beds of oysters; the Spirifer, many species, never exceeding the size of a fist, and remarkable for two internal spiral appendages, which are sometimes perfectly preserved; and the Terebratula, a smaller shell, some species of which assume the most singular shapes. Of univalves, there may be found the Melania, the Natira, the Pleurotomaria, and others. The Euomphalus

* For specimens of the very numerous and interesting fossils of the neighbourhood of Ashford, those desirous of them may apply to Benjamin Sellers of that place—a remarkably civil and intelligent man, who has the best collection of limestone fossils in the county, and (a virtue rare in fossil-dealers) is moderate in his charges.

is common, and may be known by its shape something resembling an Ammonite, except that the whorls are elevated towards one side. The Bellerophon is a wide round shell, whose inner whorls are almost wholly concealed by the external ones; it is supposed to be allied to our Argonauta. Of chambered shells, the mountain limestone contains one or two species of Nautilus; a kind of Ammonite, called the Goniatite, a small nearly spherical shell generally, with the septa of the chambers bent into acute angles; and the Orthocera, the best idea of which may be gained by imagining a Nautilus unrolled and made straight. Some fishes' teeth have been found in the limestone at Ashford.

It is worthy of notice, that when any fossils are found in the chert, the cast only of them is preserved, as is seen in the casts of the internal part of the Encrinite, so abundantly found in the chert and commonly called screw stones. The way in which the shells and other remains are found embedded in the solid rock is often remarkable, and when examined attentively will be found to afford many evidences of their having lived and died in the spots where they are now found, and of the slow and gradual process by which they have been entombed. Some species of Producta were provided with spines, and these may occasionally be found still perfect in all their delicate beauty adhering to the shell. Many, if not the majority, of the shells are filled only by crystals of carbonate of lime, and not by the compact matter of the rock, which shows that they were embedded whole and unfractured, that not even the ligature of the hinge had given way, and that the interior matter had only gained access to them by percolation through the substance of the shell.* Others, again, occur in single valves, and some have evidently been broken before they were embedded in the rock, as we might now find shells loose or broken on the floor of our seas. Occasionally, about the junction of the limestone and the shale, I have seen beds in which great quantity of fragments of shells and other things occurred, as if currents which had the power of drifting shells began then to prevail. Everything, the more we examine the rocks in their native home, instead of studying them by the help of cabinets of specimens, tends to fix in our minds the belief that we are looking on things which have been

* In a quarry near Hopton, where the shells are very perfect, I have frequently, on breaking one open, found a black shining substance, splitting into small cubes, apparently pure bitumen. Could it be derived from the animal matter of the creature which inhabited the shell? No black marks were visible externally, nor was any black stone in the neighbourhood.

formed beneath the waters of ancient seas, where the same operations were in progress as must now be taking place in our own seas, where numerous creatures of many classes were continually running the round of existence, eating or being eaten, dying or coming into life, and where slow but constant precipitations of earthy matter must be taking place, silently entombing the relics which remain.

[*To be continued.*]

[In the section across Leicestershire, in the April No., the lines representing the new red sandstone must not be taken as representing also the lines of its stratification, which is everywhere horizontal instead of oblique.]

NOTES* ON THE NATURE OF INSANITY.

METAPHYSICAL contemplation exercised patiently in reflection on consciousness, and anatomical research conducted minutely on the brain and nervous system, have altogether revealed nothing whatever concerning the *nature of Mind*, and but little regarding the *material* ORGANS through which its affections and actions are manifested. Hence, on this momentous subject, have arisen so many and so contradictory opinions promulgated as maxims by Masters in Science enjoying the brightest reputation for intelligence and wisdom. Hereon also, have rested the sources of those obstacles which continue to impede the development of a methodical philosophy for investigating the essential Nature of Insanity.

What, then, is Insanity? Is it a mental, or is it a corporeal disease? Or, is it a state in which both the body and the mind are simultaneously affected?

Our total ignorance of the Mind's nature, as has been said, and

* Founded chiefly on Chapter II of a *Treatise on the Nature, Symptoms, Causes, and Treatment of Insanity*; with practical observations on Lunatic Asylums, and a description of the Asylum at Hanwell, with a detailed account of its management; by Sir W. C. Ellis, M.D. Resident Medical Superintendent; 8vo, London, 1838; pp. 352.—For modesty and merit, this Treatise deserves the highest consideration: it discloses the practical views of a judicious and experienced physician: and these views exhibit good sense, unostentatious humanity and profound reflection, as their distinguishing characters.

our defective knowledge of the Brain and Nervous System through which the mind acts and is acted upon, will explain why so many solemn fancies have been entertained and fondly cherished, on the subject of Insanity. Superstition devised the romantic notion, that Insanity proceeded from the malignity of demonian influence; and, as a duty descending from necessity, the charge of disenchanting its victims was charitably undertaken by the priesthood, and the powers employed with this aim, were amulets, exorcisms, charms, and other mystical expedients. For more than two thousand years, the sagacity and experience of Hippocrates have preserved the profound reverence ever due to his authority; and, with this venerable Father of Physic, as well as his chief disciples in the Hellenic, Italian, Arabian and Arabistic schools, it was held for a fundamental doctrine—that *Insanity* exists as the *symptom* of a *corporeal* disease. This natural and self-evident conclusion was afterwards supplanted by the assumption wherewith inventive psychologists would represent Insanity as a *disease* of the *mind* itself, and thus endeavour vainly to metamorphose a *spiritual* system into a *material* machine with its elements susceptible of decay and dissolution. The "divine old man" attributed the disease to a mixture of bile with the blood; others held it for a result from an excessive determination of blood to the head. For a long while, among the moderns, it was generally considered purely as a *mental* affection requiring only moral remedies: more recently, however, and on substantial grounds, it has come to be regarded as a distinct bodily disease.

There is every reason for believing that all animated beings possess such a portion of mind as is adapted to their several conditions. Some require no more than is sufficient to direct them in the choice of food, to warn them of danger, and to induce them to procreate an offspring. Their instincts operate through a corporeal machinery, which is exceedingly simple in such creatures: they have "ganglia and plexus of nerves," but are destitute of brain: in those where the energies of mind are more extended, there is a cerebral organization superadded to a more elaborate development of the nervous system. Man possesses a bodily structure and mental powers, in their nature similar to those enjoyed by the brutal tribes; but in addition to the animal endowments, he is gifted with far higher and nobler faculties. He has, and ever has had, the capability of knowing and worshipping and loving God, and of perceiving divine or supernatural impressions. Now, this distinction has place wherever man is found, at the equator and at the poles, in the white-skinned European and the sable African and the Ameri-

can savage: it is a distinction that can never be obliterated. Relying on the impregnability of this induction, we may inquire—What, then, do we observe, in the formation of man, uniformly distinct from that which exists in all other animals? His brain has a more exquisite organization, and a great multiplication of its parts, many of which are not found in any other animals, even the most perfect; although, with this exception, there is no other part of the human body which, in one or other of them, is not more or less developed. Now, since there appears to be a certain limit to the manifestations of mental power in each class of animals, so also it is exceedingly probable that there exists a great difference in the mental capabilities of the individuals whereof each class is composed. This much, however, is well known—that, in various quadrupeds and the higher class of animals, and in man more particularly even to a great degree, such a difference actually prevails and is readily distinguishable.

When we judge whether the functions are healthily performed in any species of animals, we naturally look at the habits and capabilities whereby, as a species, it is characterized. We do not then consider the absence of that which is not usually found in such a species, as an indication of disordered function: nor should we reckon the existence of a capability much superior to that which appears in other species, as being of itself an evidence of functional soundness, because of the difference of their natural instinctive powers and habits. Is not, then, the same rule applicable to different individuals of the same species, and particularly to man? From experience, we learn that an immense difference, both in physical and mental powers and habits, from whatever causes, exists among mankind. Now although it has been fancied that this might be obviated by previous education, yet undoubtedly there are many such differences which no external circumstances could remove. We should be unable to form an opinion of the soundness of a limb merely from knowing its absolute power: the arm of a strong man, though in a state of disease, may be able to lift a much greater weight than the perfectly healthy arm of a person who is weak and delicate: before the absolute power then can be tested, we must know the previous capabilities. Hence, obviously, it ought to be the first object of our inquiries, in estimating the sanity of an individual, carefully to ascertain what have been the former habits and powers of his mind; what the state of his feelings and sentiments; and what his general conduct. Would it not be irrational to conclude that a man, possessing great talents, is necessarily

sane, because he is capable of performing certain mental operations with accuracy? Would it not be equally irrational to conclude that persons, having a weak mind, are not sane merely because they find themselves incapable of performing similar operations? In either case, should we not be justified in pronouncing the individual sane, when the manifestations of his affections, sentiments, intellect and general conduct continue in accordance with the previous exhibition of his mental powers and habits? These may have been such as to keep the individual incapable of performing the relative duties of life; and, for this reason, the imbecile or idiot is not held to be afflicted with insanity, which here expresses, by restriction, those cases exclusively wherein an originally sound mind has fallen into a state of unsoundness. We arrive, then, at the conclusion—that the man is "of sane mind" in whom the manifestations of feeling, sentiment, and intellect, in general conduct, continue either to improve or keep in harmony with the exhibitions of his previous powers and habits: and this constitutes the rule of distinction, whether his mental energies are great or small, whatever may have been the degree of their cultivation, and however remarkable the difference may be between him and other individuals.

Having noted these preliminary remarks, let us enter on the investigation as to the nature of Insanity; and, first of all, let us ask, What do we find as symptoms or appearances constantly attendant upon Insanity? This reply has been given:—"That which is first and invariably noticed, is some injurious alteration either in the intellectual manifestations, or in the conduct, or in both;" but this answer presents the appearance only of being precise: an attempt at definition might be preferable. Insanity means *unsoundness* merely as its primary signification; but it implies the unsoundness of what had originally been sound. By conventional usage however, the term has obtained a definite and comprehensive import; and, in general phraseology, it is now employed to express *mental* unsoundness under all its specific forms with their diversified characters. But here again, this unsoundness is conventional also; for the mind's nature remains altogether unknown, and its states are distinguished constructively by the co-existent states of those corporeal organs through whose instrumentality the operations or functions of mind are manifested. Insanity is always concomitant with disease in the brain: the chief indications of insanity should always be regarded as distinctive symptoms of a cerebral affection: new and perverse working of the Mind's animal propensities, moral sentiments or intellectual powers, constitutes the essential character of

Insanity. *Insanity then is that unusual state wherein an Individual persists in expressing unreasonable thoughts or attempting improper actions, having a tendency to injure himself or others,* with or without *discernible* disease of the cerebral structure.

Quite clear it is, moreover, that if we can show an intimate connexion between any part of the human body and the mental manifestations in human conduct which are the subjects of the alteration uniformly found in concomitance with insanity; and if we can also show that, where this injurious alteration prevails, there is at the same time diseased organisation or diseased action in such part; we shall then have done much towards arriving at a right conclusion on the nature of insanity. Now, let us put the same question essentially altered —Can we trace such a connexion between our mental manifestations and the brain and nervous system? We have seen that, in animals where the mental powers are in low endowment, there is a proportionate absence of cerebral organization; and that, in man, where the mental powers have the highest development, the cerebral organization is the most elaborate.— When the whole human brain has been rendered torpid by chronic inflammation, by gradual pressure from the slow effusion of a fluid, or by any other cause, an alteration is effected and it reduces the cleverest man to the level of the lowest animal, in point of moral and intellectual capacity: his appetite remains and he takes aliment; but, as the cerebral pressure and disease advance, so he loses the ability to perform all other voluntary actions. When the brain is excited to an unusual degree of activity, this is always accompanied with a corresponding increase of activity in the mental manifestations. Thus, when fermented liquors are taken to excess, their abuse creates an exaltation of the cerebral energies, and then the mind's operations, in feeling and sentiment and intellect, are quickened in a degree proportionate to that of the excitement which increases the brain's activity. In brain-fever with acute inflammation, the violence of the mental manifestations corresponds with the violence of the disease; and when, by cold applications with proper medical treatment, the inflammatory action is subdued, the mind then recovers its natural tone; but, the feelings and intellectual powers are never completely regained, if this action is left to proceed insidiously until the brain itself and its membranes have become permanently injured. That this is found to be the case in all instances where insanity resulted from brain-fever, a superfluity of evidences has been furnished by dissection. It is quite certain, also, that any other part of the body may be diseased or even

totally destroyed, and still the mental manifestations will remain unaffected, so long as the brain shall continue to be healthy. From these instances, then, may we not fairly conclude that there is a necessary connexion between the mental manifestations and the state of the cerebral textures; that, in the extreme cases of complete torpor and of excited action, the accompanying derangement of the mental manifestations is clearly referable to injury of the brain with disturbance of its functions; and that, since the instrumentality of the brain is absolutely requisite to the mental manifestations, we may infer that the alteration previously shown to be the invariable attendant upon Insanity in extreme cases, is to be traced in all others to a disordered or altered state of the cerebral organs, by a process of the clearest analogy and induction? This inference moreover receives conclusive support from the results of anatomical investigation: thus, in old cases, there is generally, if not universally, disorganisation of the brain; whilst, in recent cases, disorganisation of its parts rarely occurs, but the vessels of its whole surface are surcharged with blood, and thus they clearly indicate the previous existence of increased cerebral action.

Many cases, with notes of the dissections, have been adduced as evidences which confirm the foregoing deductions. Of 154 males,* 145 had extensive traces of disease in the brain or its membranes: of the remaining nine, two were idiots from their birth, one died of dysentery and another of epilepsy; the rest had not been insane for more than a few months, and they died of other diseases. Of 67 females, 62 were found with the effects of disease in the brain or its membranes: in five, no marks of previous disease were discovered. Two of these had been idiots from their birth; and, with one exception, the rest were recent cases. Altogether, these examples afford a fair illustration of what is generally found in persons whose insanity had been of considerable duration; and, at the same time, they satisfactorily confirm the theory—that increased sanguineous action, or increased nervous action, arises in the brain at the commencement of insanity.

Occasionally, there have been cases of insane persons in whom no trace of disease in the brain could be detected, even on the most careful inspection; but, from this, we ought not to conclude that in them no cerebral disease existed. We know that morbid action may continue in various parts, without leaving its effects discover-

* These cases occurred in the practice of Sir W. C. Ellis, and some of them are given in instructive detail on the pages of his valuable treatise.

able by any "necrotomical" investigation: the most skilful anatomist cannot find any traces of cramp, neuralgy, or rheumatism, by the most minute inspection. Now, we know just as little of the anatomy of the brain as of any other part of the body; but we do know that a very trifling alteration in the cerebral system will produce the most important results; as, in apoplexy, the sudden extravasation of a small quantity of blood causes death. For this reason, it has been held to be exceedingly probable that, in those instances where no trace of disease could be found in the cerebral textures, a more intimate knowledge would enable us to distinguish its presence. Besides this, however, there is another way of accounting for the failure of anatomists to discover the effects of disease in the brain, after death from insanity.

All animated beings are naturally pervaded by an active fluid essence whose separation from other elementary substances has hitherto resisted the most ingenious researches of physiologists. Hence, therefore, this essence is ranked in the group of invisible and impalpable elements: nevertheless, its existence and its agency admit of demonstration, by evidences from analogy, and by inductions founded on experience. For the reason, that it manifests itself and its operations through the nervous system, this most subtle fluid, an electric energy perhaps, is denominated the nervous principle. It exists and acts according to laws like those that regulate the existence and action of the blood; and, as the sanguineous fluid circulates through its different blood-vessels, so the nervous fluid circulates in or on its different nerves, in a profluent, confluent, or refluent course. Decidedly then, there is a nervous circulation. What the lungs and heart are to the sanguineous, that the brain and lungs are to the nervous circulation; and these two circulations are co-existent, correlative and co-extensive. Throughout the whole living frame, the sanguineous fluid distributes the supplies of organic substance: the nervous fluid distributes the supplies of vital energy, imparting the power of feeling and moving and thinking and reasoning, as it passes forwards or backwards or sideways, in circles within circles, to the textures and organs which manifest the operations of life and mind. Irregularities in the stream of nervous energy are the essential causes of many intense and inveterate diseases. As in rheumatism, cramp and neuralgy, there may be obstruction, congestion or diffusion of the nervous energy; and, from its defective or excessive distribution, many diversities of Insanity are derived and prolonged. When no disorganization or other marks of disease can be found in the brain of an insane person, his

death has been occasioned by derangement of the nervous circulation—for the most part, by nervous congestion in one or more of the cerebral organs. As long then, as the nervous principle shall remain invisible and impalpable, so long will the traces of its fatal misagency continue to elude detection in the brain and in every system of the animal economy.

Some pathologists have contended that Insanity is not a disease of the brain, but of the mind itself; and that, in the same way as fever is but an attendant on fractures and various bodily diseases; so the unhealthy cerebral states that accompany insanity are but consequences from the diseased mind. Against this notion, many unanswerable arguments can be produced: thus, if such were the case, in the same way as fever would not of itself bring on a fracture, so insanity ought never to ensue where disease in the other parts of the body has caused disease in the brain by sympathy. But there are many cases wherein insanity has arisen entirely from abdominal disease affecting the brain by sympathy, and in which the insanity subsided as soon as the abdominal organs were restored to their healthy state and ceased to irritate the brain. Others maintain the notion, that there are cases where insanity must be considered solely as a disease of the mind, because instances occur where insanity is cured instantaneously by the operation of moral causes. Now, had we no cases where diseases universally allowed to be bodily were as instantaneously brought on, and cured also, by the influence of moral causes as those which are reckoned purely mental, this argument might be perfectly valid. But cases of this kind, as in asthma, toothache, and gout, are so frequent as to be familiarly known: by their occurrence therefore, the previous notion is disproved. Equally untenable is the statement, that insanity cannot be a bodily disease, because it is often determined by joy, grief, or any powerful affection of the mind. But we know full well, that each of these will not only produce bodily diseases instantaneously; we have also numerous authentic cases which show that even death may result from the effects of violent mental emotion. If it be urged that insanity is not a disease of the brain, because disease of the brain may exist without it, to a great extent, the objection may be thus answered. We know that a disease of the lungs has existed to such an extent as would have been most painful to some individuals; nevertheless, so far from the usual signs of consumption being exhibited, no disease of the lungs whatever was suspected. Yet, from this, no one would argue that consumption is not a disease of the lungs. By parity of reasoning, then, we have no right

to contend that insanity is not a disease of the brain, because diseased brain does not always produce diseased manifestations of the mind. The fact, however, affords a conclusive reason for affirming, that different parts of the brain execute different and peculiar functions.

Having thus seen, that there is always some debasing alteration in the mental manifestations, during insanity ; and that such alteration is accompanied with diseased action or with disorganization of the brain, in cases of insanity ; we arrive at the conclusion, that Insanity is a disease of the Brain, causing an alteration in the mental manifestations. Let us next endeavour to determine the extent in which this alteration must exist before we can pronounce an individual to be insane. According to the general opinion, every insane person is totally unfit to manage his affairs, and is dangerous to society: but it can be shown, that there are as many degrees of insanity as there are of other diseases ; and that, in the same way as some bodily diseases are too trifling to interrupt the ordinary course of a man's pursuits, so there are states of insanity which neither require restraint nor incapacitate a person for the various duties of life. Before it becomes necessary to treat an individual as insane by interfering with his natural liberty, we must be able to distinguish some alteration in the manifestations of his mind. Now this alteration may exhibit itself in various modes, as regards the animal propensities, the moral sentiments, or the intellectual powers; but however extraordinary it may become both in mode and degree, as long as a man's conduct, in words or actions, displays no tendency to injure himself or others, so long he possesses a right to be regarded as a free and responsible agent. His insanity can only be determined with the two-fold test—*alteration* in his mental manifestations, and *persistence* in conduct adapted to *injure* his own interests or those of others.

AN HISTORICAL SKETCH OF FRENCH LITERATURE.

I.—ON THE CORRUPTION OF THE LATIN AND FORMATION OF THE ROMANCE LANGUAGES.

"All
Lay wrapt in lethargy; blind Ignorance waved
His leaden sceptre, and with cold dull touch
Spread wide his clustering mildew."—MITFORD.

THE advances from a state of utter barbarism and ignorance to one of reason, of talents, and of mental cultivation form one of the most interesting spectacles that is presented to us in the history of mankind. What, indeed, can be more pleasing, more truly instructive, than to trace the revival of Literature from the debasement into which, after a long train of evils, it had been plunged by error and anarchy. As such, I have in this article endeavoured to give a clear and concise view of the fallen state of Literature in the sixth and four succeeding centuries; with a description of the Corruption of the Latin, and consequent formation of the Romance languages. In future articles, I shall trace the progress of these languages, endeavouring at the same time to give a just idea of the minstrelsy of the dark ages, with a glimpse of their chivalric institutions.

That latin was the language of Gaul, as far north as the Rhine, throughout Spain, and of course in Italy, during the fourth century, is a well-known fact; and though some remote provinces might still speak the old Teutonic, all legal contracts, all official documents and all sacred works were written in latin; it was, in short, the general language of the nations of the south of Europe. We have numerous proofs in support of the fact, that these nations, when subjugated by the Romans, adopted alike their language and their customs. In former centuries, we find Pliny, Suetonius, Juvenal and Martial mentioning latin prize orations at Lyons, at Bordeaux, at Marseilles, and at numerous other towns in the south of France and in Spain: in later times, we find several petitions from the Gauls to the Roman people, all in latin.

In order more fully to comprehend the reasons of the rapid decline of the Latin language in France, let us take a cursory view of its corruption and depravation in its mother country. In marking the

general appearances of Roman literature from the age of the Antonines to the reign of Constantine the Great, we cannot avoid being struck with the rapid and almost uniform degeneracy and deterioration. Taste and judgment seem to have suffered in each successive attempt; and we see that the admirers of Cicero, of Horace and of Virgil found it easier to imitate their blemishes than their excellencies, and sought rather to catch the glare of their colouring than copy the accuracy of their drawing. Who can be surprised at the fate of literature, if he reviews the list of Emperors and considers the endless scenes of warfare, bloodshed, and confusion in which the Romans were constantly engaged. We find the unhappy state governed by monsters, invaded by barbarians, curtailed in extent, and, when freed from foreign scourges, torn by religious disputes and persecutions. Constantine the Great, though he deservedly claims our praise as a patron of men of letters, inflicted a fatal wound on Roman learning. In removing the seat of empire, he little foresaw that that portion of Roman taste and literature which followed the fortunes of his court would soon be superseded by the arts and language of the east, and that that portion which remained would fall an inevitable prey to the encroachments of barbarism. Influenced, however, by political motives, and blinded by the truly splendid ambition of founding a new metropolis, we may lament but can hardly censure these unexpected consequences, these involuntary mischiefs.

The most fatal and accelerating cause, however, to which we may attribute the fall of the Latin language, was at hand in the irruptions and depredations of the barbarous tribes from the north of Europe and the north-west of Asia. Carnage, rapine and bloodshed marked their footsteps, and Europe was shaken to her foundations by these terrible revolutions. It is generally found that conquest, to compensate, as it were, for its innumerable evils, brings with it some great, some permanent advantages: these barbarous hordes, however, subsisting upon the chase, possessed no agriculture, no traffic, no mechanical or domestic arts; they lived not in towns, nor could they endure to have their dwellings contiguous, but built wherever they found a spot to their fancy, and were generally attracted by a grove, a fountain, or a plain. The only known profession among them was that of arms: they disdained to remain in inaction, and courted dangers where they might acquire renown and display their prowess: the coward and the assassin were considered as equally execrable, and persons convicted of either of these crimes were immediately executed.

Such minds could not be brought to think of learning and the arts, unaccompanied with the desire to destroy them; and, but for the intervention of one of their most powerful enemies, literature must have been swept from the earth. This great enemy, or, to speak more correctly, friend, was *Superstition*. The blind worship of their idols induced a similar deference for their ministers; and in their conquests we find that they transferred this reverential feeling to the priests whom they found established there. Thus while the palace and the castle were wrapt in flames, the monastery and the convent escaped, and within the pale of the church alone did literature, in the midst of these terrible convulsions, find a shelter and repose. It might, under such circumstances, have been reasonably supposed that, by the priesthood at least, Latin would have been preserved as a living and established idiom: the reverse was, however, the case, and instead of teaching a language, they were content to learn a colloquial jargon, a mixture of the Latin with the harsher dialects of the barbarians.

Having thus seen the decline of the latin language in its mother country, let us return to France, where, at the commencement of the seventh century, we find no less than three languages current, namely—the Latin, which, though much corrupted, still continued the official language; the ancient Celtic or Frankish, which was, however, soon extirpated, and a new idiom, a mixture of the Latin with the dialects of the northern tribes. This latter soon became the general language of the people, and was, in consequence, universally cultivated. Towards the middle of the eighth century, we find a considerable progression in this language; this improvement proved, however, but transient, as at the commencement of the ninth century we find a great deterioration, which continued almost uniformly until the commencement of the eleventh century.

Charlemagne, whose powerful mind eagerly grasped at every means of improvement, whether physical or intellectual, made a noble though ineffectual stand against the invasions of barbarism and the encroachments of ignorance. He founded colleges and public schools in all parts of his dominions: his example was speedily followed, and in a short time there was not a cathedral, a convent, and scarcely a church of any eminence without one; but, numerous as were these seminaries, within their walls little was taught that tended to make a useful citizen or a happy individual; an education for the purposes of active life shared not part of their solicitude. The only existing professions were the military and the theological; those destined for the former seldom

frequented or soon left these schools for a more appropriate academy in the baronial hall; the latter class continued long in the trammels of discipline; and if they did not leave them better and wiser, we can only attribute it to the lamentable ignorance and the culpable negligence of their teachers.

Whether Charlemagne had himself any pretensions as a scholar is uncertain; but as he was taught grammar, which had then a very extensive signification, under Peter of Pisa, and could relish the society of Alcuin, the balance inclines evidently in his favour. But whether he himself possessed learning or not, he duly appreciated and generously patronized those who did. He pensioned men of letters, associated them to his cabinet, and admitted them to his table. Peter of Pisa, Paul the deacon, Theodulf bishop of Orleans, with numerous other men of letters now unknown, but eminent in their day, were munificently rewarded. The Anglo-Saxon Alcuin, whose name, if not his merits, is more familiar to us, will be thought rewarded to the full extent of his merits, in the possession of three abbeys and twenty thousand slaves. The literary labours of Eginhart, his secretary and biographer, were crowned with the more valuable gift of a daughter.

By order of Charlemagne was compiled a grammar of the German language, which, with the Latin, was then the language of his court; he does not, however, appear to have taken any notice of the popular dialect, which, in acknowledgement, as it were, of its Latin origin, was called *Romane* or *Romance*.

The earliest known specimen of Romance is the oath taken, at Strasburgh, A.D. 842* by Lewis of Germany to Charles the Bald, when they conspired against their eldest brother, the Emperor Lothaire; there are also some poetical fragments of nearly the same date, though their authors are now unknown. Thus we find that, in the beginning of the ninth century, France possessed (what Italy did not yet) a popular dialect subjected to certain grammatical rules, employed in official documents, and serving to express in poetry the popular opinions, passions, and prejudices.

* We subjoin the oath as a specimen of the Romance:—

"Pro Deu amur et pro christian poblo et nostro commun salvament.

"Diest di en avant in quant Deu savir et prodir me dunat si salvarai jo cist mein fradre Karl.

"Et in adjudha er in cadhuna, cosa si cum om per dreit son fradre sarvar dist in o quid il me altrezi forzet.

"Et ab Ludher nui plaid nunquam prindrai qui meon voi cist meon fradre Karl id damno sit."

But, though under the well-judged patronage of Charlemagne, literature was aroused from her lethargic slumbers, though under his jurisdiction religion was reverenced, the laws enforced, colleges opened for the instruction of the young, and pensions for the remuneration of the aged, we find that after his death the rising light of literature was quenched, and repulse and disrespect were the only rewards that literature and the arts received from the haughty barons and the licensed banditti of the tenth century. If we suppose for a moment, genius alive and emulation active, what could letters do in such a degraded state of society, and when the sword opened the only way to distinction, the silence and extinction of literature necessarily followed? The epithets of the dark, the iron age may well be applied to the tenth century; and one would turn with disgust from the consideration of its enormities, were it not attended with the reflection that the barrier was passed and that every future change must be an improvement.

Amidst these complicated distresses learning must have been inevitably destroyed but for the preservation of its choicest volumes in the conventual libraries; manuscripts thrown together by accident gradually accumulated into libraries, which the abbots were disposed to value though almost always unable to use. Three centuries after, when the spirit of literature was again aroused, transcribers appeared and the works of the immortal classic writers were no longer suffered to moulder in the cells; thus, amid the disorders of the times, did learning receive this silent though useful homage, and to their obscure and humble diligence the learned of every subsequent period must ever be deeply indebted.

But of evils and of misfortunes, though there be an excess, in time there must be an end. At length, the tide of northern barbarism was spent, and external ravages ceased; but four centuries of revolution and disorder had completely changed the face of Europe, and their effects are visible in the tenth century. The conquests of the barbarians appear uniformly to have subsided into the feudal government, which founded, as it was, on the basis of self-defence, sprung naturally from their precarious situation. Nothing, however, would be more repugnant to the genius of improvement: it established over Europe the dreadful oriental system of castes, struck at the root of royalty, or rather of all legal subordination, perpetuated slavery, scattered the seeds of civil war, and in the end deluged every kingdom with blood.

Without, however, dwelling on the degradation and degeneracy of

the tenth, let us pass on to the eleventh century. At this period we find the original Romance subdivided into two great branches or dialects, that spoken to the north of the Loire (their common boundary) was called the Romance Wallon,* while that used in the southern provinces was the Romance Provençal. These dialects, though founded on the same basis, the ancient Latin, were very different, and the dissimilarity became every day more apparent. In a country favoured by nature, under a serene sky, where the genial warmth of the atmosphere enlivens the imagination without enervating the body, the Provençal was soft-flowing and harmonious. The Romance Wallon, on the contrary, adulterated by a mixture of Frankish and Norman words, was harsh and dissonant. The rise of the Provençal may be dated from the commencement of the eleventh century: while it is from the twelfth century that the Wallon became a literary language. We have no literary monuments, no poems, no songs, which show the Wallon in its primitive state. The earliest specimen possessed by us is the code of laws imposed by William the Conqueror upon his English subjects. In Normandy, the Wallon appears to have acquired a more grammatical form and a greater polish than in any other French province; William the Conqueror was much attached to it, encouraged it greatly among his Norman subjects, and even introduced it into England, where the people were forced by rigorous punishments and severe enactments to adopt it, in preference to their native language.

Having thus given a faint sketch of the decline of Roman learning, an imperfect memorial of the degradation and degeneracy of the tenth century, and having thus followed learning to the last stage of its depression, we will reserve for a future article the more grateful task of tracing its revival, and stating the apparent causes, their operations and effects.

CRITES.

[*To be continued.*]

* The Wallon was called *Langue d'Oil* or *d'Oui*, and the Provençal the Langue d'Oc, from the affirmative word of each nation, as the Italian for the same reason was *Langue de si*, and the German *Langue de ju*.—SISMONDI.

REMARKS UPON THE PRESERVATION OF TIMBER.

The perishable nature of timber when used in the construction of edifices, and the most effectual and expeditious means of preventing its decay, has been a subject of vast interest and importance to the architect. The processes hitherto used of steaming or boiling to create a speedy evaporation of the watery part,—"impair the strength and elasticity of the timber," is tedious and attended with much expense, and does not counteract the action of those causes of decay which are inherent in wood and all organized bodies.

Decay in timber arises from various causes; if it commence while the tree is standing, it is indicated by the death of some of the upper branches; by cracks and openings in the trunk, probably from the infiltration of water into the interior; and often by an unsound root. This kind of decay, which extends from the heart outwards, continues slowly in operation after the tree is cut down. But though this decay is of importance, as there exists an effectual remedy, viz. of cutting down the tree before it has reached its maturity, it is unnecessary to speak further of it.

Decay may commence in sound timber from alternate exposure to changes in the weather—to heat and cold—to moisture and dryness. In this case, the process commences outwardly; and painting or covering the exposed parts with a coating of tar, &c. in some instances has prevented, for a time, the progress of this decay, which is termed the common rot.

As in the common rot, the causes of decay are extrinsic, and are principally brought into action in those parts which are exposed to the vicissitudes of the weather; widely different are they from those which produce what is commonly termed the dry-rot. The causes which produce this malady are the action of natural properties dispersed in the outer layers or vegetable parts of the wood, whose decomposing operations soon proceed to the internal layers until the whole structure becomes involved.

The primary cause producing this disease is the heat accompanying the fermentation of the albumen rousing into action the germs of the fungi; this vegetable structure, from its nutritious principles being afterwards hollowed out by insects, permits the access of air and moisture into the interstices, and produces what is properly termed the sap-rot, since its elements chiefly abound in the outer layers of the wood.

The most effectual means of preventing, or, more properly speaking, suspending the causes of decay which are inherent in wood and all organized bodies, is effected by Mr. Kyan's method of applying a solution of corrosive sublimate, which penetrates deeply into the wood, and by solidifying or coagulating the albumen, thus prevents the commencement of the fermentation, and the development of fungi, which are not the cause of the sap-rot, as maintained by some, but the incidental accompaniments, owing to their mucilaginous or saccharine principles.

The results from numerous experiments proving the durability that this process confers upon timber are now becoming generally known. The encouragement it receives from eminent professional men, who are using it in executing their large public works, tends to convince us of its utility; but *time* alone will show to the world what is the value of this great invention.

AN ARCHITECT.

SKETCHES OF EUROPEAN ORNITHOLOGY.

Gould's "Birds of Europe."

Parts Fifteenth and Sixteenth.

Part XV.—The first plate presents us with a rare species of Eagle, one of the smallest, but not the least typical of the genus *Aquila*; viz. the Booted Eagle, *Aquila pennata*, Steph.—Aigle botté, *Fr.* Eastern Europe and the adjacent portions of Asia constitute the habitat of this interesting bird; but it is said to migrate annually into Austria, Moravia, and the eastern part of the German territories. M. Temminck says that it breeds on the Carpathian mountains. The figure represents the bird of the natural size, and this is much less than that of the Common Buzzard. The attitude we cannot admire: the breadth of shoulders alluded to in the description is not given in the figure; there is no freshness or spirit in the drawing; the port and aspect are not those of the daring, the impetuous Eagle.

Rustic Bunting, *Emberiza rustica*, Pall.—Bruant rustique, *Fr.*

A beautiful figure of the male and female, delineated with the usual felicity of Mr. Gould's pencil. At a first glance, this rare species might be mistaken for the Reed Bunting; but the slightest examination would serve to discover the difference. The Rustic Bunting is one of the birds which have at best a doubtful claim to a place in the fauna of Europe. Siberia, Kamtschatka, and the adjacent isles constitute its native abode: it is said, however, to have occurred within the limits of the north-eastern frontiers of our continent. Of its history nothing is known; but we may reasonably conclude that its habits resemble those of the rest of the genus. Mr. Gould informs us that his figures were taken from specimens in the Museum at Frankfort.

Oystercatcher, *Hæmatopus ostralegus*, Lin.—Huiterier pie, *Fr.*—Geschackte austernfischer, *G.* The figure of this bird is of the natural size. Though tolerably good, it is not one of the best of Mr. Gould's efforts: the attitude is awkward, and does not convey the idea of an active swift-footed bird tripping along the sands, "and yet no footing seen." The Oystercatcher is a species very widely diffused and well known to naturalists. It frequents various parts of our shores, its favourite spots being low sandy beaches, from which the tide retires and upon which it finds its food, as mollusks, crustacea, &c. The strength and shape of the bill admirably fit it as an instrument for detaching Limpets from the rocks, or for insertion between the valves of Mussels, Oysters, and the like. This handsome bird is no less distinguished for sweeping velocity on the wing than for activity on the shore: it also swims with great facility, and is even capable of diving. Wilson observes of the American species —which, by the bye, he confounded with that of Europe—that, when wounded, it not only takes to the water and swims, but that it also dives well; and he adds the following:—"On the sea-beach of Cape May, not far from a deep and rapid inlet, I broke the wing of one of these birds, and, being without a dog, instantly pursued it towards the inlet, which it made for with great rapidity. We both plunged in nearly at the same instant, but the bird eluded my grasp and I sunk beyond my depth. On rising to the surface, I found the bird had dived; and a strong ebb current was carrying me fast towards the ocean. Encumbered with my gun and all my shooting apparatus, I was compelled to relinquish the bird and to make for the shore, with considerable mortification and the total destruction of the contents of my powder horn. The wounded bird afterwards rose and swam with great buoyancy out among the breakers." Mr. Gould states, that the

female Oystercatcher deposits her eggs (four in number), among the shingles; and that while "engaged in the task of incubation, the male keeps assiduous watch and gives notice of the approach of danger by a peculiar kind of whistling cry." Wilson says of the American species, that "the female sits on her eggs only during the night, or in remarkably cold and rainy weather: at other times the heat of the sun and of the sand, which is sometimes great, renders incubation unnecessary." The parent birds are very solicitous in behalf of their young, and, like the Lapwing, wheel round the intruder's head, uttering repeated cries, and counterfeiting lameness or incapability of flying very far, in order to draw him on to the pursuit, and thus lead him from the spot where their young are crouched. The species described by Wilson, is the *Hæmatopus palliatus*, Tem. *H. Braziliensis*, Licht. It is widely distributed over the American continent.

Azure Tit, *Parus Cyanus*, Pall.—Mésange azurée, *Fr.* Delicate little creatures! There they are, peering among the leaves in search of insects, and clinging to the slender spray of the birch, unbent by their weight, unshaken by their actions! Who would think that these little beings were fitted to tenant the regions of Siberia, and endure the cold of winter in these joyless realms of snow? Yet so it is. Their presence enlivens the gloomy recesses of the forests of Siberia and Russia, where man seldom ventures to intrude upon their quiet. Their nest and eggs are unknown. The only specimens in England are those from which the lovely drawings were taken; and they were obtained through the liberality of the Directors of the Royal Museum of Berlin. Of the restricted genus *Parus* nine species are indigenous in Europe, and six in North America.

Black Guillemot, *Uria Grylle*,—Guillemot à mirroir blanc, *Fr.* —Der Schwarze Lumme, *G.* The plate gives a characteristic figure of an adult, and also of an immature bird, of the natural size. This species of Guillemot is most abundant in high northern latitudes, and particularly along the coasts of the Baltic: it is also common in the polar regions of both continents. Frequents the north of Scotland and the adjacent isles; it is not often seen on the coasts of England, where the Foolish Guillemot (*Uria Troile*, Lath.) swarms in thousands; and still less frequently does it occur on those of Scotland or of France. "The northern parts of Scotland, and the Orkney and Shetland Islands (says Mr. Gould) form a place of general rendezvous for the Black Guillemot, which being less migratory in its habits than its near ally, the Foolish Guillemot, seldom quits those isolated groups, whose bays afford it shelter during the stormy season

of winter, and whose abrupt precipitous cliffs are equally inviting as a site for incubation. On the ledges of these rocks it deposits its single white egg spotted with black : the young are hatched in about three weeks, and shortly after are conveyed, but by what means is unknown, to the water, an element to which they are so expressly adapted, that their are enabled to swim and dive with the utmost facility the moment they arrive on its surface, and to brave with impunity the rough seas which are so prevalent in the northern latitudes. After the process of re-production is over, the adults are subject to a considerable change in the colour of their plumage, apparently caused by a general moult, even to the primaries which are so simultaneously lost, that the bird is, for a considerable period, deprived of the power of flight." The winter dress of the adults is mottled black and white, the latter prevailing. The young birds have the feathers white margined with black ; and the white spot on the wings, invariable in the adults, is spotted also with black.

Hyacinthine Porphyris, *Porphyris hyacinthinus*, Tem.—Taléve porphyrion, *Fr.*—Purple Water-hen, Edwards. A bold and striking figure of a most remarkable and richly coloured bird. The birds of this genus are closely allied to the Coots and Gallinules, and their manners are, to a certain extent, the same. The species represented in the plate is a native of southern and south-eastern Europe, and the adjacent portion of Africa. In former times, among the Greeks and Romans, it was in high esteem on account of its beauty ; and in modern times has received the name of *Poule Sultane*, or Sultana, for the same reason. It frequents the marshy borders of lakes or rivers, and is very abundant in marshy rice grounds ; in the swamps of Sicily, Calabria, the Ionian Islands, and the whole of the Archipelago, and in the Levant, it is very common. Its food consists of grain, seeds, and aquatic plants.

Common Crossbill, *Loxia curvirostra*, Lin.—Bec croisé commun, *Fr.*—Fichten kreutzschnabel, *G.*—Crosicro, *It.* Two very characteristic figures, representing an adult in its olive-coloured dress, and a young of the year in its evanescent roseate livery. The Crossbill is not a permanent dweller within the limits of our island, though a few instances are on record of its having bred with us ; it visits us, however, both in the autumn and spring, and sometimes (as in the months of June and July, 1821) in great multitudes. It is singular that the richest plumage of this bird should be that of immaturity. Mr. Gould observes, that doubts exist in the minds of many as to whether the rosy red colouring be characteristic of the breeding

season, or whether it be the permanent livery of the adult male; and adds the following: "During our recent visit to Vienna, we had an opportunity of observing both sexes in every stage, an examination of which afforded us abundant proofs that the red plumage is acquired during the first autumn: for we saw many lately fledged that had their plumage thickly spotted; others that had partially lost their spotted appearance and had partly assumed the red colouring; and others that had their feathers entirely tinted with this colour; while the *adults* were, as most ornithologists have stated, characterized by a plumage of *olive green*, which appears *to be permanent*." The nest of the Crossbill is placed in the fork of the topmost branches of the fir and other trees, and is composed of moss and lichens, generally lined with feathers; the eggs are four or five in number, of a greyish white, marked at the larger end with irregular patches of bright blood red, the remainder minutely speckled with the same colour. Besides the present species, which is a native of the northern regions of the old continent, another, the *Loxia pytiopsittacus*, Bechst. is also indigenous in northern and central Europe, while two are natives of North America, viz. the *Loxia Americana*, Wils. and the *Loxia leucoptera*, Gmel. which last is accidental in northern Europe.

Greenshank, *Totanus glottis*, Bechst.—*Glottis chloropus*, Nils.—Chevalier aboyeur, *Fr.*—Grunfussiger wasserlaüfer, *G.*—Plantana verderello, *It.* The easy and natural attitude of the figure representing this elegant species of Sandpiper is happily managed, and the effect of the whole is very pleasing. The Greenshank is a well-known species, and is very widely distributed, being spread over the whole of India, Africa, and Europe. It does not appear, however, to breed in the British island, but visits us in considerable abundance during its vernal and autumnal migrations. According to Mr. Audubon, it is a native of the southern parts of North America. It would appear, however, that the American Greenshank, though very close to that of the old world, is in reality a distinct species, and it has been characterized by Prince Charles Lucien Bonaparte under the title of *Glottis Floridanus*.

Snowy Owl, *Strix Nyctea*, Lin.—*Surnia Nyctea*, Dum.—Chouette harfang, *Fr.*—Schneekauz, *G.*—Alucco diurno, *It.* A magnificent plate of a magnificent species! Two figures, an adult, and a young bird in immature livery, about one-third the natural size, are spiritedly drawn, and the composition of the whole is very masterly; it is one of Mr. Lear's best efforts. If not strictly indigenous in the

British islands, this noble Owl is more frequently to be met with in Scotland and the adjacent counties than was formerly suspected. Its true habitat, however, is within the arctic circle of the old and new world. From these bleak realms it migrates southward; and it would appear to visit more southern latitudes in America than in Europe. Daring, impetuous, and fierce, this "playmate of the storm" commits havoc among the tenants of the snowy mountains; Alpine Hares, Grouse, and even Foxes fall victims to its rapacity. "The indefatigable Wilson informs us that it is a dextrous fisher, pouncing upon its finny prey and securing it by an instantaneous stroke of its foot: and Dr. Richardson states, in the second volume of the *Fauna Boreali-Americana*, that he has seen it pursue the American Hare, making repeated strokes at the animal with its foot. It hunts in the day, and, indeed, unless it could do so, it would be unfit to pass the summer within the arctic circle." The habits and manners of this species are, in fact, more those of the Falcons or Eagles, than of the *Strigidæ* generally; and the changes in its plumage are precisely similar to those of the Gyrfalcon. During the first three or four years the plumage is barred with brown, which markings become gradually indistinct as the bird advances in years, till in the old males the plumage is pure white. In the fur-countries, the Indians, and even white residents, regard this Owl as good eating, especially in the winter, when it becomes very fat. The flesh is delicately white.

Red Grouse, *Lagopus Scoticus*, Lath.—Tetras rouge, *Fr.* As we gaze on these admirable figures of the Red Grouse, the remembrance of the moorlands comes upon us—the moorlands bleak and bold, with their deep glens and swelling hills all covered with Heath and the Bilberry plant, where the Grouse makes her bed and covers her crouching brood. Too well known is this celebrated bird to require any observations: we cannot, however, forbear remarking that it is peculiar to the British Islands; it has never been found on the continent—it is exclusively our own; and may it never be extirpated from our moorlands by the wholesale destroyers of game, whose boast is not in their skill, but in the number of birds they kill in a given time, where the *packs* are thick and the birds tame and unsuspicious.

The Black Kite, *Milvus ater*—Milan noir, ou Parasite, *Fr.*—Schwartzer Milan, *G.* Mr. Lear's figure of this Kite is very good; the attitude is easy and natural, but the head does not quite please us—it seems as if pushed down, as if the size of the stone had prevented the artist from completing his outline as originally designed.

—The Black Kite is not indigenous in the British Islands; yet, as Mr. Gould observes, "judging from its extraordinary powers of flight, and from the wandering habits of the generality of the *Falconidæ*, it is not improbable that it may have penetrated so far west as our island, and have been mistaken for the common species." It is abundantly distributed over Germany, France, Switzerland, and the European countries bordering the Mediterranean sea.

Bar-tailed Godwit, *Limosa rufa*, Briss.—Barge rousse, *Fr.*—Rostbrauner wasserlaufer, *G.* We do not admire this plate. The bird in its summer dress is badly drawn, and the perspective utterly wrong; indeed there is no perspective at all. The bird in question is standing on a bank, apparently at a very considerable distance, and dipping its bill in a piece of water, not close to the brink, but half-a-mile out, or nearly so: while on another bank, a good bow-shot (in true perspective) beyond the first, stands a bird in its winter dress, rather larger than the bird in its summer dress. Both are stated to be of the natural size, yet they are on a distant landscape. If our readers consult the plate, they will not think us hypercritical. However, in the midst of so much to admire, we may well pardon worse faults: indeed, it is because the plates in general are so beautiful that a faulty one is the more startling. In other works, this very plate would be deemed good.—The native haunts of the Bar-tailed Godwit are the high northern regions of Europe, whence it migrates southwards in autumn, and whither it returns in spring. It visits our island during its vernal and autumnal travels, and some few individuals sojourn with us during the winter, tenanting the mouths of rivers, creeks, low muddy shores, and marshes along the coast. Its summer plumage is rufous varied with brown; in winter its dress is grey pencilled and dashed with dusky brown. In Holland, this species abounds in winter, and also on the coast of some parts of France. From the former country our markets are supplied with these and other waders during the winter season. Its parallel on the American continent is the *Limosa Fedoa*, Vieill.—Aud. plate 238. The *Limosa Hudsonica* there represents our Black-tailed Godwit, *L. melanura*.

Alpine Accentor, *Accentor Alpinus*, Bechst.—Accenteur pegol, ou des Alpes, *Fr.*—Alpen fluevögel, *G.* Of the genus, *Accentor*, three species are European; namely, *A. Alpinus*, *A. modularis*, and *A. montanellus*. An undescribed species, Mr. Gould observes, inhabits the Himalayan mountains; none are American. The present plate presents two figures of the Alpine Accentor, of the natural size,

both excellently drawn. Though this species is strictly a native of the Alpine districts of continental Europe, several specimens have been taken in England, and that not in our rocky provinces, but at or near Cambridge, in the midst of a low flat tract of country, little adapted, one would suppose, for the sojourn of a bird whose congenial residence is among the bold rocks and cliffs of the Tyrol, the holes and fissures of which afford it a place of nidification. Its eggs, like those of our Common Accentor, (or Hedge Sparrow), are greenish-blue. The casual visit to our island of birds not possessing powers of rapid flight, birds not strictly migratory in their habits, and natives of a distinct locality, is very remarkable, and not easily accounted for. In the present instance, we have a bird peculiar to central and southern Europe finding its way westward to our island, led thither by some train of circumstances which we cannot well comprehend. Mr. Selby figured a specimen killed in the garden of King's College, Cambridge, and now in the museum of the Rev. Dr. Thackery; but he does not inform us at what part of the year it was obtained, nor does Mr. Gould advert to this important point.

Twite, *Linaria montana*, Ray.—Grosbec á gorge rouge, *Fr.*—Arktische fink, *G.* The plate represents a figure of this pretty little bird, chastely drawn, true and natural. Small birds, by the way, are Mr. Gould's *forte*.—"The Twite, though possessing a longer tail than the Linnet, has a more delicate contour of body, and is, as we think, a more diminutive bird. In this respect our opinion is not in accordance with that of Mr. Selby, who states 'it is rather larger than the Common Linnet, being bulkier in the body and having a longer tail.'" The habits and manners of this bird resemble those of the Common Linnet, which bird it closely resembles in general appearance. "It is abundantly dispersed over the northern portions of Europe, even within the regions of the arctic circle. It also passes the summer, but in smaller numbers, on the uplands of Scotland, the Western, Orkney, and Shetland Islands." Mr. Selby says that it breeds in these places, its nest being built "amid the tops of the tallest Heath, lined with wool, fibres of root, and the finer parts of the Heath." The eggs, five in number, are of a pale bluish-green colour, spotted with pale orange brown.—In autumn it leaves the mountains of the Scottish main-land and isles, and, joined by flocks from Norway, Sweden, &c. joins the Common Linnet and travels southward. Taken in company with this bird, by the London bird-catchers, it is easily distinguished from the Linnet by its note, expressive of the word *twite*, whence its English name.

Short-toed Lark, *Alauda brachydactyla*, Temm.—Alouette à doights courts, *Fr.*—Die Kurtzehige Lerche, *G.*—La Calandrelle, Bonelli, in *Mem. de l'Acad. &c. Turin.* Two beautiful figures!—The Short-toed Lark, with the *Alauda calandra*, the *Alauda bimaculata*, and the *Alauda tartarica*, may be regarded as constituting a distinct sub-generic group, distinguished from the typical Larks—the Sky Lark for instance—by the more powerful and robust form of the bill, and by the comparative shortness of the toes.—This group has received the title of *Melanocorypha*, Boié. Of the four species, all inhabit southern Europe, with the exception of the *Alauda tartarica*, which is a native of the high northern latitudes.—The Short-toed Lark abounds in the hot plains of the Spanish peninsula; it is also found in France, Italy, Sicily, and the north of Africa. Like the Larks of the restricted genus *Alauda*, it makes its nest on the ground. The eggs are plain, of a pale Isabella yellow.

Dalmatian Pelican, *Pelicanus cuspus*, Feldegg. The drawing of this bird is by Mr. Lear, with all the spirit and all the mannerism of that artist; the beauties, however, prevail over the defects: it is a striking and effective plate.—The Common Pelican, *Pelicanus Onocrotalus*, and the present are the only two species which can be placed in the list of the Fauna of Europe. Two species, *P. trachyrhynchus* and the *P. fuscus*, are found in America. It is but lately that this noble bird has been discovered and characterised; well, therefore, may Mr. Gould say: "A bird of such striking magnitude as the present having so long escaped observation, even on the shores of Europe, what may we not expect from those more distant countries, to which the scrutinizing eye of the naturalist has seldom penetrated! Although this species has been introduced to the notice of the scientific within the last few years only, it has doubtless long abounded where it is now found. The specimen from which our figure was taken was sent us by Baron de Feldegg, and was one of twenty-four killed by him on the shores of Dalmatia. In the letter which accompanied this specimen the Baron thus writes: 'The first example of this bird that came under my notice, was shot by myself in the year 1828, in Dalmatia, and was sent to the imperial cabinet in Vienna. Two years after this, Messrs. Rüppell and Kittlitz met with this species in Abyssinia, where, however, it would appear to be very scarce, as those gentlemen procured only a single specimen. In the year 1832 I published a description of it, under the name of *Pelicanus crispus*. The *Pelicanus crispus* has undoubtedly escaped notice in consequence of no naturalist having seen both species (viz.: this and the

P. onocrotalus) together, as I have in Dalmatia, where it arrives in spring and autumn, and where it gives preference to the neighbourhood of Fort Opus, on the river Naranta, which is bordered with morasses. It comes through Bosnia, seldom alone, but generally in flocks. I have seen as many as twelve together hunting for fish: it is very cunning and extremely difficult to shoot. I obtained, at different times as many as twenty-four examples." The *Pelicanus crispus* differs from the Common Pelican in possessing a beautiful crest and mane of narrow elongated silky feathers; in the naked space round the eye being smaller; in the feathers of the breast being stiff, lanceolate, rounded at the points, and of an elastic texture; in the body being more bulky and larger in all its proportions; and in the tarsi being stouter, of a different colour, and considerably shorter." The crest, however, appears to be a variable character, as Baron Feldegg says:—"At all seasons of the year old birds may be found both with and without the crest. I saw a specimen in M. Aker's menagerie which had always had it, while a bird of the same species in another menagerie had none; in all other respects they were the same, and were very healthy, and I possess a female in which the ovaries were largely developed, and which has a large crest covering the whole of the head; which circumstance induces me to conclude that it is a very old bird."

Yellow-breasted Bunting, *Emberiza aureola*, Pall.,—Bruant auréole, *Fr.* Two beautiful figures, representing the male and female of this rare and elegant Bunting.—The native habitat of this species is Kamtschatka, Siberia, and the Crimea; its claim to a place among the list of British birds rests on the circumstance of its having been killed a few times within the precincts of our island. Its habits and manners are little known, but no doubt resemble those of its congeners. It is the *Emberiza Sibirica*, Nov. Comn. Petr. v. 15, p. 488.

The Whistling Swan, or Hooper, *Cygnus ferus*, Ray,—Cygne sauvage, *Fr.*—Der Singschwan, *G.*—Cygno salvatico, *It.* The figure of this bird, by Mr. Lear, is bold and masterly; the neck, however, might be improved: it is too much like a jug handle. Four Swans are indigenous to Europe: 1st, the Tame Swan, *Cygnus olor*, originally from north-eastern Europe.—2nd, a very close ally, distinguished, among other things, by the permanent pale fleshy white colour of the bill and legs. It is the *Cygnus immutabilis*, Yarrel, and has been very lately characterized. It inhabits the north of Europe, and is a not unfrequent winter visitor to our island.—3rd,

Cygnus ferus, Ray. *Anas Cygnus*, Linn. the species represented in the plate under present notice.—And 4th, Bewick's Swan, *Cygnus Bewickii*, Yarr. a native of Europe generally, and differing from the Whistling Swan in being less in size, in the form and markings of the bill, in having eighteen instead of twenty tail feathers, and in the greater extent to which the trachea extends into the body of the sternum.*—Selby states that both the *Cygnus ferus* and the *Cygnus Bewickii* are natives of the northern parts of America. This, however, is not the case. The two Wild Swans of North America are the *Cygnus Americanus*, Sharpless, and the *Cygnus buccinator*, Richardson; both of which are allowed to be perfectly distinct from their European relatives.—Of the habits and manners of the Whistling Swan, or Hooper, nothing need be said. It is an annual winter visitor to our island, frequenting rivers and sheets of water, often in considerable flocks; and the vast numbers both of this species and *C. Bewickii* seen and shot in England during the late winter, 1837–38, may be regarded as affording an index of the severity of the season in the higher latitudes, whence they were driven southwards in multitudes.

Black Scoter, *Oidemia nigra*, Flem.—Canard macreuse, *Fr.*—Die Trauer-ente, *G.* The figure of this well-known species is very characteristic: it represents a male, of the natural size, tranquilly floating on the water, from the depths of which it obtains its prey.—A native of the arctic regions, the Black Scoter visits our seas and those of Holland, France, &c. in great numbers, during the autumnal migrations of the flocks southwards, and again in the spring, on their return to the north: numbers also stay with us during the whole of the winter, and take their departure with the return of spring, when the morasses and lakes within the arctic circle, undisturbed by man, are unlocked and offer an asylum. Like the rest of the section of oceanic Ducks to which the present belongs, its flesh is nauseous and unfit for food. It subsists principally on bivalves, as the Common Mussel. We have often examined the gizzard of this bird: it is lined internally with a strong tough coriaceous membrane of considerable thickness; its muscular parietes are of prodigious depth and solidity: the whole forms a mill, of which the two parts work upon each other, grinding between them the enclosed Mussels and crushing them to pieces.

Green Sandpiper, *Totanus ochropus*, Temm.—*Tringa ochropus*, Gmel.—Le Chevalier cul blanc, *Fr.*—Punktierte strandlaüfer, *G.*—

* See Yarrell, in *Trans. Linn. Soc.* 12, 445.

Culbianco, *It.* The figure of this bird is tolerably good, but the perspective of the ground it stands upon is out altogether. It is represented on the same plate with its close ally, the

Wood Sandpiper, *Totanus glareola*, Temm.—Le Chevalier sylvain, *Fr.*—Wald Strandläufer, *G.* The Green Sandpiper certainly breeds with us, at least occasionally, and probably more frequently than is suspected. It has been observed in Wales during the summer, frequenting the small mountain streams in the neighbourhood of Snowdon and elsewhere; but we are not aware that its nest has actually been found. It is one of our autumnal visitors, and gives preference to secluded ponds, rivulets, and marshy places, instead of the mouths of rivers or the sea-beach, to which most other members of the family resort. Its range of habitat is very extensive: it is "dispersed over the whole of Europe, the greater part of Asia and Africa, but is not found in America, its place there being supplied by a totally distinct species," viz. *Totanus chloropygius.*—"It differs from the Wood Sandpiper in its large size, its shorter tarsi, and in the more diminutive spotting of the upper surface."—"The Wood Sandpiper is still more rarely seen in the British Islands than its near ally, but in every other particular the history of the preceding species is applicable to the present. It is, however, even more widely dispersed, as is proved by its being found not only over the whole of the Asiatic continent, but in most of the islands of the Pacific Ocean also, which we believe is not the case with the Green Sandpiper." The *Tringa solitaria* of Wilson, a native of the United States, differs from the present species only in having the two middle tail-feathers of a uniform brown tint; while in the *T. glareola* they are alternately barred with brown and white.

Gorget Warbler, *Calliope Lathami*, Gould—La Calliope, *Fr.* A lovely drawing of the male and female of this rare and elegant species of Warbler, which Mr. Gould regards as the type of a distinct genus, to which he has given the title *Calliope.*—"Among the sub-divisions into which the *Sylviadæ* are now distributed, we do not find one," he observes, "to which we can strictly refer the present beautiful bird: we have, therefore, ventured to form a new genus for its reception, taking the specific designation of Pallas for its generic designation. We cannot perceive its immediate relationship to the Accentors, to which M. Temminck has referred it. Both Gmelin and Latham have considered it to be a Thrush, *(Turdus)*; but although not ranging with any established genus of that family, its form is very similar to some of the smaller species of that group. In

the silky character of its plumage, in the presence of the gorget, and in the great difference between the sexes, it evinces a close affinity to the Blue-throated Warbler, *Phœnicura suecica ;* but in its general contour it approximates to the Nightingale, *Philomela luscinia,* to which we consider it to be most nearly allied."—The Gorget Warbler is scarcely to be regarded as a native of Europe; indeed it has been occasionally only taken within the borders of our portion of the globe. Its true habitat is north-eastern Asia and the island of Japan. It is said to have an agreeable song. The rich scarlet gorget which adorns the male is wanting in the female, whose general tint is olive brown.

Barrow's Duck, *Clargula Barrovii,* Swains. et Richards. This rare and beautiful Duck is figured with admirable fidelity and taste. A male of the natural size is represented resting on the water in an attitude at once easy and spirited.—One instance only is on record of this Duck having been killed in England. It is a native of the northern regions of America, and was first described in the *Fauna Boreali-Americana,* by Dr. Richardson, who observes :—" Notwithstanding the general similarity in the form and markings of this bird and the Common Goldeneye, the difference in their bills evidently points them out to be distinct species. Exclusive of other characters, the Barrow's Duck is distinguished by the purer colour of its dorsal plumage, and the smaller portion of white on its wings and scapulars. Its long flank feathers are also much more broadly bordered all round with black.—The specific appellation is intended as a tribute to Mr. Barrow's varied talents and his unwearied exertions for the promotion of science."

Blackthroated Thrush, *Turdus atrogularis,* Temm.—Merle à gorge noir, *Fr.* The plate represents a male and female of the natural size. The figures of each are admirably drawn: we know not which most to admire; both are perfect, and the composition of the piece is very happy. This beautiful Thrush, distinguished by its black gorget, is common in the Himalayan range of mountains, but can scarcely claim a place among the birds of Europe. M. Temminck states it to be a native (rare, we presume) of Hungary and Russia, and as occasionally occurring in Austria and Silesia. Mr. Gould says, " we have only seen two specimens killed in Europe, which are in the collection at Vienna, and one of them was, we believe, killed in the neighbourhood of that city." Of the manners of this elegant bird we have no accounts.

The Yellow Bunting, *Emberiza citrinella,* Linn.—Bruant jaune,

Fr.—Goldhammer, *G.* A pair of these well-known, but most elegantly-attired birds are delineated with the pencil of truth and delicacy. One would almost fancy them about to take wing.—Of the Yellow Bunting we need say nothing. Who does not know it?—who has not admired it perched on the road-side hedge, along which it flits as you approach, from distance to distance, and still not far away, as if desirous yet too timid to be noticed? This bird is spread over Europe, but appears to be confined within the boundaries of this quarter of the globe, as it has never been met with in collections from other quarters.

Marsh Harrier, *Circus rufus*, Bris.—Busard harpage, ou de marais, *Fr.*—Brandweighe, Wasserweighe, & Sumpfweiher, *G.* We do not quite like this plate, by the pencil of Mr. Lear. The bird standing upright is as stiff as a badly mounted specimen; and its companion lying down, setting the head aside, is not much like anything that claims the name of bird, save that it is clothed with feathers, which, however, are rather like large scales than feathers, and so might easily be mistaken.—" The size of this bird" observes Mr. Gould, " renders it so conspicuous, that it cannot fail to attract attention wherever it appears: it is consequently most probable that the greater number of those which are seen in our island are not native bred specimens, but have wandered from the adjacent continent; and we are confirmed in this opinion by the circumstance of most of the birds which have been shot being in the youthful or immature plumage. We know, also, that young birds are in the habit of wandering greater distances from their birth-place than adults. So great indeed are the chances against their attaining a state of mature plumage in our island, that we do not recollect a single instance of a specimen, in the plumage of the bird figured in our plate, having been killed here. That it is many years in attaining this plumage is evident, and it is equally certain that it breeds while yet in the deep chocolate coloured plumage by which it is distinguished during the first and several succeeding years."—The Moor Harrier is widely distributed, being found in the low marshy districts of Europe, Asia, and Africa. It is the *Falco æruginosus* of Linnæus, *Falco albanella con il collare*, Stor, *des. Ucc.* V. I.

Barred Warbler, *Curruca nisoria*, (*Nisoria undata*, Bonap.)—Becfin rayé, *Fr.*—Gesperbter grasmücke, *G.* The figure of this bird is very excellent.—It is a native of the northern regions of Europe, occurring abundantly in Sweden and in the north of Germany and Hungary. Mr. Gould observes, that it is with hesitation

he assigns this bird to the genus *Curruca*; influenced in so doing by the consideration that, of all the then established genera among the *Sylviadæ*, it is to this that it approaches the nearest. The Prince of Musignano has recently established a new genus for its reception, under the title of *Nisoria*, of which it stands as the type. Its peculiar features consist in its lengthened elegant form and its gray tone of colouring, relieved by numerous transverse bars of black and white.

Sabine's Snipe, *Scolopax Sabini*, Vigors. This rare bird is figured in company with the

Common Snipe, *Scolopax Gallinago*, Linn.—Becassine ordinaire, *Fr.*—Heerschnepfe, *G.*—Beccacino reale, *It.* Both birds are well drawn, but the Sabine's Snipe stands on a ground out of all perspective.—Of the Common Snipe nothing need be said. The *Scolopax Sabini* is to be distinguished by the total absence of white from its plumage, or any of those tints of ferruginous yellow which extend more or less in stripes along the head and back of the Common and others of the genus. The occurrence of this bird in the British Islands is very rare. "The first example was killed in Queen's County, Ireland, in August, 1822, and was sent to Mr. Vigors the same day: it was described by him under the above title in Vol. XIV. of the *Trans. Linn. Soc.*, and is now contained in the museum of the Zoological Society. * * A second example was shot on the banks of the Medway, near Rochester, 1824. Besides these, Mr. Selby informs us that he has received a fresh specimen of this rare Snipe from Morpeth; and we ourselves know of another example killed in Ireland. * * In the number of its tail feathers, which are twelve, it differs from the *Scolopax major*, which has sixteen, and from *Scolopax gallinago*, which has fourteen. It agrees, however, in this point with *Scolopax gallinula*, which has also but twelve: but it can never be confounded with that bird, from the great disproportion between the essential characters of both; the bill alone of *Scolopax Sabini* exceeding that of the latter species by one third of its length."—Of the native regions of this Snipe and of its habits nothing is known.

The Lanner Falcon, *Falco lanarius*, Linn.—Faucon lanier, *Fr.*—Le Vrai Lanier, Buff., *Ois.* V. I, p. 243. Eastern Europe, Asia, and Africa, are the portions of the globe over which the range of this fine Falcon extends. Its visits to Western Europe, are only occasional: it has never occurred in our Islands. The Lanner occupies an intermediate place between the Peregrine Falcon and the Gyrfalcon, but approximates nearer to the former, from which, how-

ever, it differs, among other points, in never possessing the transverse markings with which the breast of the adult Peregrine is ornamented. The general tone of colouring on the upper parts is deep brown, each feather having a paler border. The under surface is yellowish white, with lanceolate dashes of brown—The figures of two birds, an adult and young, rather less than the natural size, are very characteristic.

Common Sparrow, *Pyrgita domestica*, Cuv.—Le Moineau, *Fr.*—Haus Sperling, *G.* A pair of these birds, admirably drawn, are figured in contrast with the Tree Sparrow, *Pyrgita montana*, Cuv. Grosbec friguet, *Fr.*—Der Feldsperling, *G.* This species may be distinguished from its well-known ally by being smaller in size, and in having a black patch on the ear-coverts, and a rich chestnut crown. The sexes are alike in colouring. In England the range of habitat of this species is very local, being scarcely known in some counties and common in others, as in Essex and Cambridgeshire. It is found in central Europe, in China, and the Himalayan range of mountains.

Naumann's Thrush, *Turdus Naumanni*, Tem.—Merle Naumann, *Fr.* The figure of this beautiful Thrush is very spirited and characteristic.—This species is intermediate between the Fieldfare and the Redwing. It is a rare visitor in the eastern parts of Europe, and still more rare in the central countries. One has been killed near Munich. The true habitat of this bird is Japan and the adjacent regions of Asia. Of its habits we know nothing.

The Common Wild Duck, *Anas Boschas*—Canard ordinaire, *F.*—Gemeine-ente, *G.*—Anatra salvatica, *It.*—Canard sauvage, Buff. The plate represents a male and female Wild Duck, in full plumage. The figure of the male, in particular, is very excellent; nothing can exceed the delicacy of the pencilling; it faithfully renders all the minute zigzag lines which ornament the sides and scapularies of this beautiful bird, and the velvety texture of the feathers of the head, resplendent with glossy green. The more we examine the more we have to admire in this admirable production of the "mimic pencil."—The Wild Duck is too well known to require any special notice.

Reed Locustelle, *Locustella fluviatilis*—Becfin riverain, *Fr.*—Flussanger, *G.* The figure of this beautiful but sober-coloured bird is very attractive—it is easy and natural.—The Reed Locustelle is clearly allied to our Grasshopper Warbler, *Locustella sibilans*, in habits, manners, and notes. It is a native of Austria and Hungary, and is very common in the Island Gardens in the Danube,

near Vienna. "The specific term *fluviatilis*, as applied to the present bird, conveys an erroneous impression," observes Mr. Gould, "for M. Natterer informs us, that although it resorts to low situations, it nevertheless does not confine itself to reed-beds, but rather prefers swampy copices and thickets." With deference to Mr. Gould, we submit that the term *fluviatilis* (translated *riverain* by the French) is applicable: it implies nothing respecting *reeds*; and why *Reed* Locustelle, instead of *River* Locustelle, should have been fixed upon as the English name we cannot conceive.

Red-breasted Goose, *Anser ruficollis*, Pall.—Oie à couroux, *F.*—Die Rothals Gans, *G.* Mr. Lear is successful in the figure of this splendid bird; it is a masterly drawing.—The Red-breasted Goose is a native of the north-eastern regions of Asia, whence a few individuals occasionally wander westward and southward: four or five instances are on record of its having been taken in our island. The first instance was in 1776, near London; the bird passed into the hands of Mr. Tunstall, and is now in the museum at Newcastle-upon-Tyne. Another was captured alive, near Wycliffe, and was kept alive some years by the gentleman above-mentioned. A third was killed near Berwick-upon-Tweed, and formed part of Mr. Bullock's celebrated collection. Others, Mr. Stephen informs us, were killed in the severe winter of 1813, in Cambridgeshire.

Honey Buzzard, *Pernis apivorus*—Buse Bordrée, *Fr.*—Wespen Busard, *G.* A good and well-drawn figure.—The Honey-buzzard is far more abundant in the British Islands than is generally suspected, several instances having come to our knowledge, not only of its capture but also of its breeding in this country. Its flight is easy and graceful, and like its near ally, the *Buteo vulgaris*, its great size attracts the notice of the keeper and sportsman, to whom it soon becomes a prey when it takes up its abode in our woods or parks. The range of this bird is not confined to Europe alone, as is proved by our frequently having observed it in collections from India. Insects, the larvæ of wasps and bees, lizards, and mice constitute its food. From the common Buzzard it may be at once distinguished by the small and closely-set feathers which cover the space between the bill and the eye, which space, in all the rest of the *Falconidæ* is either bare or thinly covered with fine hair or bristles.

Common Night Heron, *Nycticorax Europæus*,—Bihoreau à manteau noir, *Fr.*—Der Nacht-Rheiher, *G.*—Sgarza nitticora, *It.*—A bold and masterly drawing of an adult and young bird; it is full of life and spirit.—"No bird," says Mr. Gould, "can better show

the necessity of minor subdivisions of large families than the common Night Heron. The genus *Nycticorax* is now, we believe, universally acknowledged. Seven species at least are known to us, most of which are inhabitants of remote and distant regions: one being found at Terra del Fuego, another in New South Wales, and a new one having lately been discovered in Manilla. The common Night Heron is the only species found in Europe, over the whole of which it is dispersed; as also over the whole of Asia and the northern regions of Africa; and if not identical, the Night Heron of North America bears so great resemblance to the European bird, as to require an experienced eye to detect the difference. The American birds are, however, we believe, larger in all their proportions." The Prince of Musignano has distinguished the American Night Heron under the specific title of *Nyct. Americanus*. The young birds differ from the adult not only in their colour, which is brown varied with dashes of whitish yellow and white, but also in the absence of the beautiful pendent plumes from the occiput, which form so conspicuous an ornament in the adult. In the intermediate stage it has been regarded as a distinct species, under the name of the Gardenian Heron.

Spotted Crake, *Zapornia porzana*—Crex porzana, Bechst.—Poule d'eau marouette, *Fr.*—Punktiertes rohrhuhn, *G.*—Gallinella aquatica sutro, *It.* In form, this pretty bird, of which the plate gives a good representation, is closely allied to our common Corn Crake (*Crex pratensis*). It is one of our summer visitors, arriving early and departing late. Pools, rivulets, and marshy places overgrown with reeds, are its favourite haunts, and it swims with great facility. In these points it differs from the Corn Crake, which frequents the rich meadows, threading the tall grass, which serves it as a cover, with great rapidity. The Spotted Crake is abundant in Asia and the north-eastern parts of Europe, The genus *Zapornia* was founded by Dr. Leach, for the reception of two species, *Zap.* Pusilla and *Zap.* Baillonii; and Mr. Gould refers the Spotted Crake to this genus rather than to the *Crex*, of which the Corn Crake is the type. It builds a floating nest, composed of stalks of plants rudely intertwined and attached to the stems of reeds, or placed upon a collection of them by the water's brink.

Meadow Pipit, *Anthus Pratensis*, Bechst.—Pipit Farlouse, *Fr.*—Wiesen pieper, *G.*—Le Cujelier, Buff. Pl. enl. This interesting little bird is beautifully represented. It is the Tit-Lark of the older writers, and is too well known to need any particular notice.

Black-tailed Gannet, *Sula melanura*, Temm. "We are indebt-

ed," says Mr. Gould, "to the kindness of M. Temminck for the loan of the fine specimen of this bird from which the accompanying figure was taken, and which, he informed us, was killed in Iceland. In every respect, except in having a black tail, it resembles the Solar Gannet (*Sula Bassana*), which bird, when fully adult, has a white tail. Whether this difference be an accidental variation—or, if not, whether the difference is of sufficient importance to justify a specific distinction—we are unable to decide." A much less difference, if permanent and not accidental, would go to *prove*, not to *justify*, a specific distinction. The fact is, that we know but little about the bird in question. Probably it is a distinct species from our long-established tenant of the Bass Rock; but we wait for a series of specimens. The figure is very good, and represents the bird about three-fourths of the natural size.

Jack Snipe, *Scolopax Gallinula*, Linn.—Becassine sourde, *Fr.*—Moorschnepfe, *G.*—Beccacino minore, *It.* A pair of these birds are well represented and beautifully coloured.—Like its relative, the Common Snipe, the Jack Snipe is one of our autumnal visitors, leaving us in spring for the arctic regions, where it rears its young. It is the least of the true *Scolopacidæ*, and is spread throughout the continent of Europe generally; but not much beyond its eastern limits. Among the numerous collections received by Mr. Gould from the Himalaya Mountains, he only remembers a single specimen. The individual from which the drawing was taken, Mr. Gould informs us, was taken alive by himself, from before the nose of the pointer, a proof how closely it crouches, and how much less ready it is to take wing than the common species. Indeed, it sometimes almost allows itself to be trodden upon before it will rise. In other respects its manners are those of the Common Snipe.

Black-and-White Lark, *Alauda Tartarica*, Pall.—Alouette nègre, *Fr.* Two figures are given of this species of Lark, the one in winter, the other in summer, plumage. Both are disproportionately large to the ground, and therefore give the appearance of larger birds than is really the case, the figures being of the natural size.—The *Alauda Tartarica* is a native of the high northern regions of the old continent, where it enjoys a most extensive habitat, being dispersed, as we have reason to believe, over the whole of Siberia, Northern Russia, Lapland, &c., and from whence it performs periodical migrations into more temperate climes. Like the *Plectrophanes nivalis*, and *Lapponica*, it is subject to very considerable and contrasted changes in the colouring of its plumage at opposite seasons. During the rigorous months of winter, its clothing

is remarkably thick and warm; the feathers, which are then elongated, are encircled with a band of light tawny grey, and falling closely over each other, conceal the black colouring of the base of each feather. On the approach of summer, a decomposition takes place in the lighter portions of the feathers, which gradually break off, and leave the bird, in the height of summer, of a jet black, which style of dress continues until autumn when a moult takes place, and the bird again appears in its usual winter clothing. Why the term "Black-and-white Lark" should have been selected as an English name for this bird, we cannot imagine. In our observations on the Short-toed Lark (*Alauda brachydactyla*) we stated that for four species, one of which was the *Alauda Tartarica*, Boié established a genus under the title of *Melanocorypha*, which is now adopted. These species, we may again remark, are the *A. bimaculata*, *A. brachydachtyla*, *A. calandra*, and *A. Tartarica*. In habits as well as in form, they differ from the typical Larks, and constitute a well-marked group. The last species, *Melanocorypha (Alauda)* Tartarica is very rare, and seldom to be met with either in public or private museums.

While we were engaged upon the above pages, the talented and persevering author of the *Birds of Europe* took leave of England for Australia, in order to study, in their native regions, the birds of that interesting portion of the world, with the view of giving to the scientific, and to the patrons of science, a history of their habits and manners, with figures upon the same plan as those in the splendid work before us. May that success attend his enterprise which he so richly merits.

CWM BYCHAN; A LEGEND OF THE THIRTEENTH CENTURY.

NEAR the north-west boundary of Merionethshire there is situated a very remarkable and sequestered dell. This, by the natives, is called Cwm Bychan, and with it are connected many traditionary legends. It is embosomed in wild and barren mountains, amid rocks which some mighty convulsion in nature has thrown into every variety of form and aspect. On three sides it is inaccessible, and

can only be approached by a narrow gorge, through which a lake discharges its redundant waters. At flood-times the cascade leaps foaming and dashing from stone to stone, whirling in numerous eddies among the broken ground bordering the ravine, down which, as it gradually widens into one of the many valleys intersecting this mountainous district, the stream pursues its tortuous course. At one time, it glides gently and silently through some deep pool, worn by time and constant erosion; then again it plunges wildy over some craggy declivity in an impetuous cataract, throwing far and high the misty spray from which the sunbeams may be seen reflected in a thousand rainbows.

The lake is drear and desolate. From their peculiarly sheltered situation, its waters are rarely ruffled by the passing winds; it lies black and sullen, imprisoned within its rock-bound chasm. The few aquatic plants which grow on its margin are stunted and sickly. It affords no abode to any of the various fish which abound in the waters of this region: it is therefore rarely resorted to by amateurs of the piscatorian art; nor is it generally frequented by roamers in search of the picturesque.

A precipice rises abruptly from the head of the lake to a height of several hundred feet, and the strata are thrown nearly in a vertical position, presenting a smooth face of stone which forms an insurmountable barrier in that direction. For a little distance on each side of the lake, the ground is level except where masses of rock, which have been detached by tempests and other causes from the over-hanging summits, lie in uncouth fragments. The cliffs, which gradually approximate until they form the narrow gorge before-mentioned, present a broken and irregular surface, and the rugged points and jutting ledges which intersect them, enable a skilful and daring mountaineer to climb the ascent which an inexperienced eye would deem impracticable.

The eagle builds her eyry, and rears her young in the hollows of these rocks: and there also the sea bird often finds a shelter from the sweeping storm. A few lichens and mosses cling to the craggy steeps, and diversify with spots of green the dark appearance of the barren heights. Near the top, where the slope is less precipitous, and where the breezes of heaven can kiss with their dewy lips the steril soil, the wild heath and shamrock bloom in their native freshness, and the sportive goat springs playfully from crag to crag, exulting in its mountain freedom. Near the entrance to the dell there may yet be seen the remains of an ancient cromlech, the sacrificial altar where were celebrated the mystical rites of the Celtic deities.

The Druids exercised all-powerful sway throughout the Cumbrian land, but they preferred the groves of embowering oak and the flowery meadows as sites for their temples. The pure morality inculcated and allegorically expressed, in the usages of this order, have been much misrepresented and perverted, through the imperfect nature of tradition and the prejudices of historians. The offering of human sacrifices, and the devoting of victims to the fire have been advanced as proofs of barbarous habits, but no authentic evidence can be brought forward on which to found such accusations, against the druidic institutions. From what can be collected of the virtue of their precepts and the wisdom of their lore, it is possible that the Druids might have been the depositaries of those brighter gems of religion which, at the ultimate dispersion of mankind, were distributed over the face of the earth, and which subsequently spread their heaven-born light through the dark ages of superstition and coloured with their softening tints even the most extravagant mythologies. The Druids worshipped Nature in the beauty of her works and the sublimity of her wonders. They taught of infinite power and intelligence, for their knowledge of causes and effects in the physical world told them that blind chance or fabled divinity, was incapable of creating and maintaining the order of the universe. In their sacred groves and sylvan temples, they saw displayed the calm loveliness of nature: in the foaming torrent and cloud-capped mountain they beheld her grandeur.

There is perhaps nothing which more expands the mind and gives it more exalted ideas of the vast immensity and sublimity of creation, than the contemplation of mountain scenery. Whether we survey the towering peaks of the Andes with their snow-clad summits, which seem to pierce the azure vault, and form mighty links between the expansive heaven and the fruitful earth: whether we survey the abrupt escarpment of the Himalaya range, down which the eye vainly seeks a resting place and the brain becomes dizzy with the dreary depths or the overhanging precipices: and whether we survey the ice-bound pinnacles of the Alps, the undulatory slopes of the Appenines, or the pine-clothed heights of the Dofra Fell—in them all we behold the same omnipotent hand which moulded into shape whatever is, and placed the mountains on the earth as seals to hold together all the various parts, to poise and balance it as swift it whirls through boundless space. Such reflections cannot fail to show to man his own insignificance and the littleness of all his works. What are the boasted Pyramids of Egypt, or the far-famed palaces of Babylon? Had the whole of

them been quarried from one of our British hills, no eye could have discerned the absence of so minute a fragment; and when the hand of time shall have crumbled them to dust and mingled them with the surrounding sands, who shall trace out the once proud towers and mighty monuments?

It was during the early part of the reign of Edward the First that the incidents related in the following narrative occurred.—When that monarch returned from the Holy Land, he found himself placed in undisputed possession of the English throne. The various factions which had prevailed during the late reign, and which had deluged the kingdoms in the blood of civil war, had now subsided, all parties seemed willing to put themselves under the authority of the new king. The vigorous and restless mind of Edward, however, could not long endure the inactivity of peace. He longed for some object on which to exercise his enterprising genius and to employ the energies of his subjects. He determined on the subjugation of Wales which, for many centuries, had been a turbulent province never thoroughly conquered, taking every opportunity of throwing off its allegiance when civil dissentions or foreign expeditions had occupied the English troops.

Edward levied a considerable army and entered North Wales. The Welsh, who could not oppose him in the open field, took refuge in the inaccessible regions of Snowdonia where, for some time, they defied his power; but, at length, through famine and the perseverance of their enemies, they were dislodged and obliged to sue for peace. Heavy conditions were imposed on the vanquished by the conqueror; but these soon after were violated. The Welsh flew again to arms: another army was sent against them; they were again defeated, and Llewellyn their king was slain. His brother David became nominal sovereign of the country, but he was a fugitive and a wanderer in the land of his fathers. Hunted from place to place, with a price set on his head, this unfortunate Prince still endeavoured to maintain the liberty and independence of his native soil. Inheriting from his hardy race, indomitable courage joined to the quenchless light of patriotism, he beheld with a swelling heart and a maddening spirit the foot of the proud invader tread those wild mountain-tops and beautifully romantic vales over which he had heretofore ranged as free as the fetterless winds that play over them.

With a few faithful followers who still adhered to him in his adversity, and who still remembered their past hours of freedom and of joy, he continued to elude his enemies, and frequently made suc-

cessful attacks on small bodies of their troops. Intelligence was at length brought of his retreat, and a sordid traitor proffered for a reward to betray his benefactor and his king! A strong detachment was immediately sent to secure the ill-fated monarch, under the command of Mortimer, one of Edward's generals. This officer, though a young warrior, combined with an ardent and a daring soul all the kindlier and more generous feelings that constitute the true hero. Bold and sanguine in the field, cool and temperate in the council, bland and gentle amongst his associates, he was alike feared by his enemies and beloved by his friends.

The party moved slowly and cautiously through various mountain passes, guided by the heartless betrayer, until they gained a sequestered hollow. This was deeply embosomed amid rugged crags and overhanging precipices, so begirt with inaccessible rocks that it might be deemed impregnable, but for treachery which renders vain alike all the defences of nature and the precautions of art. In this retired hold they found David with his hardy band, who, though surprised, were not dismayed at the signal of the approach of the hostile force, and each one flew to arms, resolving to sell his life as dearly as possible. But it was in vain to struggle against the superior numbers which now poured upon them: one by one they fell unconquered even in death. The prince placed himself against a rock; and, like the Roman Dentatus, for some time kept his foes at bay. At his side, though somewhat sheltered by a projecting rock, stood a boy, who watched with a vivid and an intensely painful gaze every motion of the monarch's arm, and frequently apprised him of his danger. At length the youth fell severely wounded. The king turned for an instant to look on his prostrate form and thus neglected his guard. The assailants rushed upon him, seized and bound his hands, and bore him away a prisoner.

History records that this prince was tried, condemned, and ignominiously executed, for no other reason than that of having defended his native land from the usurpation of a tyrant. In the mean time the boy Thalwyn, who had shewn some indications of returning life, was carried by the humane directions of Mortimer to his own tent. The young commander himself frequently watched the sick-bed side, and ministered to the various wants of his charge.

Some time elapsed before the youth exhibited any symptoms of recovery. The anguish of his mind aggravated the pain of his wound, and materially retarded his convalescence. Mortimer tried by every art to sooth and divert his grief, sometimes cheering him with the hopes of renewed health, and sometimes beguiling the

tedious hours of his suffering with anecdotes of life and adventure. At first he received all the care and attention that was bestowed upon him with silence and seeming indifference. After the poignancy of his sorrows, however, had been blunted by time, the boy acknowledged the kindness, and a grateful look, a slight pressure of the hand, and a few low words of thanks would occasionally escape from him.

At length Thalwyn recovered his former health and vigour; and the first day on which he ventured from the tent to survey the beautiful face of nature, he found himself standing in the midst of the picturesque vale of Ffestiniog: he beheld the wood-clad rocks with their luxuriant foliage. He turned to the river meandering like a vein of silver through the more cultivated parts of the vale: he strained his gaze to the distant ocean, now calmly sleeping in the embrace of the azure sky. The contemplation of such a scene awoke in his soul all its past associations. He thought on the days of his childhood and the home of his fathers, on his lost country and departed friends; and then in the bitterness of utter bereavement, he burst into a flood of tears. Mortimer regarded him with pity and deep interest; for the knowledge of his misfortunes and the gentleness of his manners had won the regard of the English general, who had witnessed the boy's bravery at the capture of his king. There was something, also, in the young Cambrian's demeanour, an innate nobility of bearing, which alike commanded sympathy and respect.

Thalwyn had the appearance of being about sixteen years of age. He was tall and graceful. His form, though slight and delicate, was beautifully symmetrical. There was an air of pensive melancholy and subdued sadness about his general behaviour, as if he bore his fate with placid resignation; but the occasional flashes that gleamed from his expressive eye betrayed the inward workings of an unsubdued spirit. His fair hair clustered in profuse curls over an open and intelligent brow, on which might be traced already the lines of suffering and of sorrow.

Mortimer approached and spoke to the impassioned youth in the soothing words of kindness. "Come, my brave boy," said he, "cheer up! you shall have nothing to fear: I will be your friend, you shall be to me as a brother." The youth took his hand and pressed it to his lips; and, still keeping his eyes on the landscape, he said, "I pray Heaven bless and reward you, noble and generous foe! I owe you much, infinitely more, than I can ever repay; but suffer my weakness now, for my heart is sick, my soul is oppressed.

the remembrance of the past is upon me!" Then, as if addressing the surrounding objects, he thus continued:—"Farewell to the playmates of my early youth; to the smiling faces of my kindred and friends! Farewell to the joyous song of the shepherd on the hills, and the swelling strains of the harp in the banquet hall! Farewell to my country's freedom! Cambria, thou art fallen! Thy glory has departed! Thou, who hast stood against the powers of tyrants and maintained thy liberty for a thousand ages, thou hast no longer a name! Where are my fathers; and where the warriors whose blood was spilled on thy once happy soil! Where are the mighty men, the memory of whose deeds shall live in Fame's bright annals! And where is the line of kings who proudly swayed thy sceptre! Gone! gone! for ever gone! But still I hear their voices in the waving boughs and rippling streamlets! They speak in the mountain winds and in the roaring cataracts! Yes! I hear the full chorus of their spirits as they ride on the sweeping clouds that flit across yon blue expanse! I hear the pealing shout, the unconquered Briton's cry, We are free! We are free!"

During this apostrophe, Thalwyn had raised his face to Heaven, and his beautiful countenance, lighted by the fires of poetry and patriotism, appeared radiant with an expression more than earthly. Mortimer gazed upon him with wonder, not unmixed with awe. That one so young, and apparently so meek, should be enabled to think and speak with the force and energy of mature years, seemed to him both extraordinary and unaccountable. In these times, superstition fully sanctioned a belief in the agency of supernatural powers and in the gift of inspiration. The Cambrian youth, brought up from their infancy to disdain slavery and oppression, and to glory in freedom and independence, imbibed from their bards and sages the most enthusiastic sentiments. No wonder, then, that this boy who had enjoyed peculiar advantages of education should have a mind so much beyond his years both in feeling and imagination.

Time rolled on; weeks and months passed away. Order began to be established and government maintained in the conquered provinces. At first the yoke pressed hard upon the vanquished; they felt all the misery of slavery, save the bonds; and their proud spirits were galled under the restraint which was laid upon them: but by degrees they submitted to the victor and yielded a passive obedience to the rule against which they found it vain to struggle. There were still, however, a few desperate men who, driven to the rocky fastnesses, associated themselves together in small bands, and committed petty depredations on the surrounding district: but these

were not deemed of such consequence as to require a military force to be sent against them.

Mortimer had remained on the station in the valley of Ffestiniog during this period; but he had now only a small body of troops with him; and was in daily expectation of being recalled. Thalwyn had become his page and was his constant companion. He was much attached to the youth, partly from a knowledge of his misfortunes, and partly from his peculiarly engaging manners, his well-informed mind, and the loftiness of his sentiments. Every spot of his native mountains was familiar to him, and he would frequently be Mortimer's guide through their wild scenery. When engaged on these expeditions, the gloom which generally hung over him was dispelled, and the free air of the hills seemed to give elasticity to the mind as well as vigour to the body.

Often when standing on some jutting rock or craggy pinnacle to survey the lovely landscape which lay outspread beneath them, he would forget his present condition and the woes of his country, and with warm enthusiasm, with animated gesture and a beaming eye, he would relate the traditions and legends of his father-land.

When interrogated regarding his parents and kindred, he was reserved and silent. The subject seemed to awaken the most painful sensations, and on this account it was seldom mentioned.

At length the expected order arrived. Mortimer was to repair instantly to Normandy, at the head of a considerable army, for the purpose of quelling the rebellious vassals in that kingdom. As this service was sure to be attended with much hazard and danger, he proposed to his page that he should remain in England under the care of a trusty friend. Thalwyn heard the proposition with a downcast look and a tearful eye; but, after a moment's consideration, with a brightening countenance, he replied:—"No! this must not be. I must accompany you. You are my only friend, my only guardian. I will share your fate, be it what it may! Think not that the chance of peril will blanch my cheek, or the approach of danger make my heart quail. Have I not lived amidst hardships and deprivation, strife and bloodshed? Cradled in the mists of the cloud-capped mountains and nursed in the ruthless blast of the sweeping tempests, I dread not the power of the elements! Then, I have seen war and the direst devastation, with all the aggravated enormities of fiendish cruelty. I have seen the bold and the freeborn struggling against the oppression of the proud and ambitious. I have seen the brave, the generous, the noble, despoiled of their home and their heritage, severed from their fondest affec-

tions, degraded, persecuted, trampled on, outcasts and wanderers. I have seen all that I loved on earth fall murdered around me; yet I trembled not in that fearful hour: I thought but of blood and of vengeance; but *that* thought has passed away. I feel that I could undergo pain and bonds and torture, nay, death itself, if love or gratitude required such a sacrifice. Then let me attend you: let me share your weal and woe. It may be that the poor and humble page may have some opportunity of rendering service to his lord and benefactor!" Mortimer could not resist this appeal. He determined that Thalwyn should accompany him, and the necessary arrangements were made.

It was now the evening before their departure. Mortimer retired at a late hour to his tent. His mind was intent upon the past, the present, and the future; he in vain courted the requisite repose; and while restless and ruminating his attention was attracted by the merriment of a party of his soldiers who had warred in the East, and who were now recounting to each other the wonders of Palestine, and singing the triumphs of the Cross over the Crescent, in the

SONG OF THE CRUSADERS.

Away to the battle field we go,
Where glory awaits us and death to the foe;
Our lances gleam o'er the plain as we dash,
And our shields in the sunbeams brightly flash.

Our souls as the chainless winds are free,
And our hearts are united in chivalry;
Our coursers are swift as the eagle's flight,
And we scorn the boast of the Moslem might.

Hark! 'tis the cymbals that ring afar;
Hark! 'tis the pagan trumpet of war.
On, on, let the infidel quickly feel
The power and weight of the Christian's steel.

We meet in the fearful shock,
The spears shiver!
The swords quiver!
They fly as the scattered flock!

The paynim host is lost,
Their champions quail,
Their cimetars fail,
Before the sword that's cross'd.

Our blades are wet with gore,
The crescent flies,
The Moslem dies,
The sanguine strife is o'er!

Then away from the battle field we ride,
And our banners float on the azure tide,
As, with heart and voice, we raise on high
The shout of triumphant victory.

Mortimer rose and looked out of the tent: all was still, save the tread of the sentinel walking to and fro without the camp as he gave the quick responsive "All's well" to the challenge of the watch.

Masses of dark clouds swept rapidly across the sky, obscuring for a time the light of the moon, which ever and anon shone forth in calm, majestic loveliness over the scene, silvering each woody slope and dew-fringed leaf. There was not a breath of air stirring in the valley; but the floating rack and the distant murmurs from the hills, shewed that the breeze was dancing merrily over the mountain tops. All was hushed: the soldiers, as they lay around, some under the slight covering of a tent, and some under the canopy of heaven, were folded in the calm deep sleep of conscious security and peace.

After surveying the scene for some time, and refreshing his feverish brow with the cooling air of night, he again threw himself on his couch, and was soon lost to the sense of all external objects and impressions: but his rest was doomed fearfully to be broken. Soon fell on his ear the well-known cry of To arms, To arms. The enemy are upon us! Defend yourselves! He started instantly to his feet, snatched his sword, and rushed out of the tent. The moon, which had just emerged from a dense cloud, and now shone clear and bright, shewed him a number of wild savage figures, half naked or clothed in rough skins, armed with long knives, axes, and heavy clubs, which they brandished with frightful outcries. This desperate band had surrounded the camp and were now commencing the work of slaughter. The inhuman yells of the Welsh, as they darted on their victims, and the deep imprecations of the English as they sank beneath the weapons of their merciless foes, produced the most appalling discords.

The surprise was complete. Mortimer in vain endeavoured to rouse the courage of his troops, and to rally them to resistance; but they seemed paralysed with the suddenness of the attack, and thus

were butchered by their ferocious assailants. At length, collecting a few who had recovered their presence of mind, he called on them to follow him. Wherever he turned the enemy shrank before him, but his valour was unavailing. One by one his followers met their fate; and he now stood alone amongst his foes, who, with a fierce shout, proclaimed their triumph, and quickly surrounded the chivalrous Mortimer. Thus hemmed in, he continued to defend himself with the most obstinate bravery. His sword was raised for a deadly stroke, when he received a blow which felled him senseless amidst his dying and dead comrades.

The morning broke, clear and bright, on the town of Caernarvon. The sun, as he glanced o'er the eastern hills forming the black range of Snowdonia, shed his golden beams on the towers of the majestic castle, throwing their shadows far across the bay. Eleonora, the consort of King Edward I., had been some time resident at Caernarvon, where she had lately given birth to a son, afterwards Edward the II., as imbecile a monarch as ever swayed the English sceptre. But it was not in the tapestried chamber, with the carpeted saloons, and all the luxury of modern taste and extravagance, that the queen brought forth the young prince; but, as tradition says, "this event took place in a small room not more than ten feet square, situated in the eagle tower, which room possessed the unusual comforts of a window and fire-place." But to return to the morning in question: at an early hour, a most unusual bustle prevailed in the town, and in the roads leading to it. All the barons and chief men in the country were assembled together, and groups of peasantry continued to pour in from the surrounding districts. Wonder and expectation were displayed in every countenance. They all collected in a square in front of the castle, which reared high its massive portal with its four portcullises and embattled parapets. The troops, to the amount of some thousands, were drawn out on a rising ground which commanded the town, under pretence of doing more honour to the approaching ceremony, but in truth to guard against any outbreaking of public feeling. The King at length appeared on the battlements, and every voice was hushed. His tall majestic figure and his commanding countenance at once pointed him out, and impressed upon the beholders a feeling of fear and admiration. He spoke to the people at some length on the evils of discontent and rebellion, and on the advantages of peace and union to the two kingdoms. He then proceeded: I have promised to give you a prince born in your own land, nurtured under your own skies, one who has breathed nought but

your own free mountain air, one who knows not the language of the Saxon, whose foot has never trod English ground, whose life and conduct are without reproach; who, as a countryman, will protect your property and defend your rights. I am now about to redeem my pledge." Then, turning to an attendant, he took in his arms an infant and presented him to the people, saying "Behold your prince! a true-born Cambrian! See! he smiles upon you and asks you for your friendship and support! You cannot refuse to give them."

All were taken by surprise. They gazed on the monarch and on his son in silent astonishment during his address. The most trivial circumstances very frequently determine the bias of public opinion. In this case, the child's smile did more than all the eloquence of the father. After a short pause, there burst forth one simultaneous shout of "Long live the Prince of Wales."

When the exhibition had ceased and the assembly began to disperse, a horseman was seen making his way with difficulty through the crowd. His steed was jaded, and the rider looked pale and haggard. He forced his way up to the gates of the castle, and solicited an audience of the King on a matter of life and death. Edward, who heard what passed, ordered him to be admitted. The portcullis rose accordingly, and the next moment the messenger found himself within the court of this place of strength. He was quickly ushered into a chamber, at the upper end of which the king waited to receive him. The young man approached and made obeisance. "What is your name and business?" demanded the monarch, "methinks it must be something urgent and extraordinary to need our personal attendance at a time like the present. Speak." "I am called Thalwyn," replied the youth boldly, "my intelligence will speak for itself. I am the page of your Highness' faithful servant Mortimer. He was last night surprised by a band of mountaineers, his detachment was cut to pieces, and himself carried away a prisoner." Thalwyn then recapitulated the details of the attack of Ffestiniog, and stated farther, that while assisting Mortimer to defend himself, he was struck down by one of the assailants, and remained insensible for some time; and when he recovered consciousness, the enemy were just retiring, after having plundered the camp of every thing valuable. He succeeded in ascertaining, by their conversation, that Mortimer was not dead, but a prisoner; and that they intended to bear him with them to the mountain glen called Cwm Bychan, and there to sacrifice him to their ruthless revenge.

The King heard the narration with increasing interest, and when it was concluded, exclaimed: "These are indeed strange tidings,

and they claim our especial interference. I would rather lose half the Principality, than that evil should befal my brave general. He must be rescued. Let a strong body of horse be instantly despatched on this service. Let them utterly exterminate this horde of savages. Let them approach the rocky fastness by some circuitous route, and see that none of the miscreants escape. Whoever will faithfully guide the party to the required spot, shall have a purse of gold and a king's favour for a reward."

Thalwyn now spoke. "I ask not for favour and reward, neither would I receive any; yet I will direct them. Every mountain-path I know well. Every ravine and precipice is familiar to me. I could tread over the wildest tracks fearlessly, through the darkness and through the tempest." "Stay," interrupted Edward, speaking to one of his attendants, who was about to depart for the purpose of seeing his orders executed, "there may be more in this story than meets the ear; and it behoves us well to be cautious in receiving such a report." Then, fixing his penetrating eyes upon the youth, he thus interrogated him—"Methinks, by the manner of thy speech, thou art not of Saxon lineage." Thalwyn shrank not beneath his glance, but met it with its equal, and replied: "I am of nobler blood than ever throbbed in Saxon veins!" "By that proud boast," said the king, "I deem thou art one of these rebellious Welsh." "I am, in truth," returned the page, "a child of that oppressed and injured people." "And," said Edward, "would, no doubt, gladly repay some of those injuries by betraying our brave followers to the knives of your savage countrymen. Away with him! Let him be closely watched. We will soon ascertain the truth of his tale."

Thalwyn's eyes flashed fire during this accusation; and at its conclusion, stepping boldly up to the king, he thus addressed him:—"Know, proud prince, that not for all thy broad lands and fawning vassals; not for all thy boasted fame and bright renown; not for all the pomp and power that wealth can give; nor yet to free my country from the hated yoke that now rests upon it: no, not for all these together, would I be guilty of a treacherous deed. To deceive and betray more befit a base Norman robber than a free-born Briton!" A frown gathered on the king's brow; and the page, as if suddenly recollecting the necessity of subduing his own feelings on the present occasion, changed the tone of high defiance which he had assumed to one of supplicating entreaty. Falling on his knees before Edward, he thus continued:—"Oh! if you have ever felt the tie of gratitude; if you have ever felt the bond of love; if you

have ever been restrained from assisting the friend who was most dear to you, when perils and dangers surrounded him, and your hand might have saved him; you cannot refuse me your sympathy, your assistance. Mortimer once rescued me from a cruel death; he has since been my friend, my benefactor, my more than brother. I could now willingly sacrifice my life, if it would secure his freedom. You may imprison me, you may torture me; but I swear that all I have said is true. I entreat you, by your duty as the king and father of your people; I conjure you, by your plighted faith as a true and noble knight; I implore you, by your feelings as a man, to listen to my request, and send instant relief to the gallant Mortimer. Oh! I beseech you, lose not a moment: it may be now too late! He may have fallen a victim to the revenge of his enemies. Oh! if you do not believe my story, let me go: I can at least die with him!" The flushed cheek, the dilated eye, the parted lip, the agitated frame, all showed how intense was his interest in this appeal. Edward was much moved, and after regarding Thalwyn for some time, as the youth knelt with uplifted hand, awaiting his fate, he said:—"Thy countenance is too open to harbour treachery, thy tongue is too bold to utter a falsehood: I will trust thee. Up and away, then! Take five hundred of my bravest veterans. Be faithful, and God speed your undertaking."

In the meantime, the unfortunate Mortimer, wounded and unconscious, was borne away between two of the band, while the whole party made such speed as the nature of the ground would allow, in order to regain by daybreak their secret hiding-place. They had to cross that mountainous district which lies between the counties of Caernarvon and Merioneth, and which presents, perhaps, one of the wildest and most inaccessible tracts in this region. It was through this scene of barren desolation that the mountaineers took their way. The two men who carried the prisoner were more than once resolved on leaving him to perish on the mountain, as they found a difficulty in keeping up with their companions, owing to the necessity of taking a more circuitous route with their burden. They arrived at length at the entrance of a narrow gorge which formed the bed of a torrent, though at that time the water scarcely trickled down its rocky course. They paused, while one of the party went forward to reconnoitre, and he soon made a signal for the rest to advance. They ascended with some difficulty the broken and slippery paths, until they came to the lake described in the early part of this narrative, as embosomed in a hollow of the mountains. Here they were greeted with a cordial though brief welcome

by a few of the band who had been left, as it seemed, to guard the fastness, and who regarded Mortimer with the greatest surprise and evident satisfaction. He was now perfectly sensible of all that was passing around, and fully aware of the utter hopelessness of his situation. Though he did not understand their conversation, yet from their fierce gestures, and the savage looks with which they glared upon him, he felt that he was a doomed victim, and that to plead for mercy would be vain, and only expose him to the taunts and derision of his captors. Nevertheless his courage did not fail him; he stood erect, and looked around with an air of haughty defiance. One who seemed a chief now spoke, and told Mortimer that he must prepare to die; but that, as they desired all their companions to witness his death, and as some of them must be summoned from a distance, the execution would be deferred until night, "when," concluded the speaker, "every drop of thy blood shall answer for the life of a brave Briton!" He was then placed in one of the caverns with which the surrounding cliffs abounded; and, after being strongly secured, he was left alone.

Mortimer had ample time, during the weary day which followed, to think on the horrid fate that awaited him; to mourn over his slaughtered comrades; to lament the loss of his faithful page, whom he had seen lying with the dead. Naturally brave and fearless, he could have met any danger in the open field; he could have boldly faced death with his sweeping scythe of war; but thus to be massacred in cold blood, without the excitement of strife or battle, unseen and unregreted, was too much for his stoicism. He shuddered when he contemplated the prospect. Nevertheless he determined to nerve his mind to endure the worst, and to die as became a man and a warrior.

The shadows of evening had begun to darken over Cwm Bychan. The atmosphere was unusually close and oppressive; not a breath of air waved the dark waters, or moved through the rock-rent ravine. Yet larger masses of clouds, which hung suspended over the tops of the hills, seemed drawn together by some potent but unseen influence. All was silence, all was gloom: the general appearance of the heavens portended one of those storms which so frequently prevail in mountainous districts; but, at present, Nature seemed resting on a balance, which held in either hand the warring elements.

Several small parties of Welsh had arrived during the day; and now, the whole of the band being assembled, it was determined to bring out the prisoner for execution. A large stone was prepared, on which the fore-doomed victim was to be bound; and as all were

desirous of bearing a part in the work of vengeance, every hand could inflict a wound. The young soldier, completely wearied by the fatigue and anguish he had undergone, had forgotten his situation and danger in the oblivion of sleep. He was carried in imagination back to his early days, and was busy amid the scenes of his childhood and the hours of his infant pleasures, when a rude hand made him start, and the voice of the chief who had before spoken fell fearfully on his ear—"Up, up! The time is come that thou must die!" Mortimer quickly collected himself. He rose and followed the speaker. When he came out on the level space bordering the lake, the scene which presented itself was enough to appal the stoutest heart. He found himself in the midst of several hundred of the wildest and most ferocious-looking figures, some bearing torches, and all armed with long knives, which they brandished in a menacing manner when he approached. He looked up to the heavens. One deep impenetrable pall of blackness overspread the landscape. The tempest had gathered above them, and only seemed to wait a signal to discharge its fury upon their devoted heads. Not a sound was heard, save the crackling of the burning torches and the quick-drawn breath of the relentless barbarians. Mortimer was bound to the huge stone, and the first hand was raised to strike, when a bright flash disparted the vaulted sky, flooded each rock and crag with a blaze of lurid light, palsied every hand, and made every heart quail. The next instant the thunder-clap burst in all its terrific magnificence, shaking the solid ground, and rending the sultry air. From hill to hill, from valley to valley, far and wide, the shock was reverberated. The eagle fled shrieking from his shelter in the cliffs, and the wild goat uttered his sharp cry, as he started from his heathy lair. Another and another flash came in quick succession. Large drops of rain began to fall, and the storm burst with resistless violence. Accustomed as the mountaineers were to behold such convulsions of the elements, they were now dismayed and terrified. After pausing a moment to gaze on each other, they fled and sought refuge in their caves. Mortimer was exposed to the whole fury of the tempest. The rain descended in torrents, but he was incapable of moving. The crags around him were shivered by the lightening's stroke, and an immense fragment, riven from its rocky bed, rolled crashing at his feet. The fires played over him; the waters drenched him: yet he was unhurt. He invoked death; he called on the elements to crush him: yet he was unscathed.

By degrees the violence of the storm subsided. The lightening

was less vivid and less frequent. The thunder was subdued into distant murmurs. The rain ceased to fall, the sky became clear, the moon and stars shone forth in renewed brightness. In a short time there was nothing to tell that the quiet order of nature had been disturbed, save the rushing of the waterfall, which foamed impetuously down its rugged channel. The sentinel on the lofty eminence of Carreg y Saeth had, like his comrades, sought shelter from the tempest; but now that it was past he resumed his post, and the rest of the party, emerging from their retreats, proceeded to finish the work of sacrifice.

They again approached their victim, and were about to sheath their weapons in his breast, when a shrill cry from the sentinel arrested the deed of blood, and the next instant beheld him hurled from the precipice headlong into the deep waters below. A hundred lances gleamed on the heights above; the gorge was filled with armed men: escape was impossible. The late storm had favoured the approach of the English soldiers, who, under the guidance of Thalwyn, had toiled ceaselessly to rescue their general from destruction. With a simultaneous shout, "To the rescue! to the rescue! no quarter to the miscreants!" they commenced the attack. Those on the heights threw down stones and missiles, while others forced their way up the paths, and fought hand to hand with the outlaws. Thalwyn was the first to reach the place where Mortimer was bound; he severed his fetters and placed a sword in his hand, which the warrior was not slow in turning to good effect. The struggle was brief, but bloody. The Welsh were cut off to a man, and the English troops soon found themselves in undisputed possession of the glen.

But where was the brave boy who had conducted them through the dangerous and untrodden paths, the page to whose fidelity and courage Mortimer owed his happy deliverance? He was sought for in vain among the living, and was at length found lying stretched on the ground, wounded and senseless. Mortimer hung over him, and watched him with the tenderest solicitude; but it was long ere he recovered consciousness. When he first opened his eyes, and saw who was near him, a faint smile played over his pallid countenance; and when he had regained a little strength he called Mortimer to him, took his hand, and thus addressed him:—

"I am dying. I would say a few words before the cold finger of death is laid for ever upon my lips. I am not what I seem to be: but it is time to away with all disguise. I am Vinvena! Nay, start not; but hear me. You see before you the unfortunate

daughter of a line of kings: the last of a noble house. I followed the fortunes of my father through perils and persecutions. When your soldiers took him prisoner, I hoped never to have survived the disgrace. *You* rescued me. At first my only thoughts were of vengeance. Your kindness by degrees won upon me: I admired your noble and generous character, and (why should I hesitate to own it?) I loved you! Yes, I loved you with all the devotion of a woman's love! I knew that I could never be ought to you, and yet I loved you! You were father, kindred, country, fortune, fame, every thing to me. I abandoned every wish, save that of serving you. That wish has been gratified. I guided the timely succour. Thank heaven, you are safe; and *I* have saved you!—And now, welcome, death! welcome, oblivion of the past! Soon shall I be united to those who were dearest to my soul! Yes, I hear the spirits of my fathers calling upon me to join them in those realms where there shall be no more wars, or sorrow, or death. Farewell, this earth! Vinvena, thou art free!"

M. E. M.

PROCEEDINGS OF METROPOLITAN SOCIETIES.

GEOLOGICAL SOCIETY.

April 4th.—A very elaborate paper on the structure of a new *Plesiosaurus* was read by Professor Owen; in the course of which a profound dissertation relative to the position of a vertebra, suggested by certain peculiarities noticeable in those of that extinct genus, was introduced, and illustrated by a variety of diagrams. This masterly treatise elicited the liveliest approbation, and its leading points were eloquently descanted on by Dr. Buckland, who congratulated the Society and science in general, on the auspicious circumstance of the noble Hunterian Museum of Comparative Anatomy being entrusted to the care of one so competent to appreciate and avail himself of the treasures therein deposited, and from whose youth, conjoined with his very high attainments, there was every reason to anticipate a long succession of equally valuable memoirs,

such as do honour even to the nation which produced their author. A discussion followed, which had been postponed from the previous meeting, relative to a remarkable disruption of the tails of the *Ichthyosauri*, always at a particular vertebra; from which it had been argued, by Professor Owen, that not improbably a fin, analogous to that of many *Cetacea*, had existed in the recent animal; for it was remarked that no indication of such an appendage was visible in the osteological structure of the *Cetacea*, whence, had we been acquainted only with the skeletons of those animals, as in the instance of the *Ichthyosauri*, the former presence of so highly important a locomotive organ would certainly never have been suspected. He was led to surmise, therefore, in order to account for this constant disrupture of the caudal vertebræ of these animals always at one place, and from the appearance which the discontinuation presented, that a weighty appendage must have broken down the vertebral column, when, the dead animal having floated on the surface until decomposition had loosened the attachments of its bones, and its investments having been sufficiently coherent to have confined the gases disengaged by putrefaction for the required period, it at length sunk on the bursting of the skin; and an argument was accordingly deduced from this presumed circumstance, for the tranquillity of the waters at the time this gradual process was going on. Sir Philip Grey Egerton, Bart., Dr. Buckland, the Rev. W. Conybeare, Professor Phillips, and Mr. Darwin, argued the possibility of this explanation, and concurred, for the most part, in the view entertained by Professor Owen.

April 25th.—Three communications of a descriptive nature were read: the first, from Mr. Bowman, on the geognosy of the neighbourhood of Abergavenny; the second, from Mr. Malcolmson, upon the structure of part of the county of Elgin, announcing that the Wealden rocks are considerably developed in the north of Scotland, deviating, in some instances, mineralogically, but enclosing numerous fossils, identical with those found at Swanwich; the third, by Mr. Austin, related to the limestones of Devonshire, for the manner of formation of which a novel theory was proposed, suggesting that they had been originally deposited in their present inclining order of stratification, upon a conformably shelving surface. Mr. Murchison then stepped forward, to comment on what he termed some valuable practical details that had been laid before the meeting: details in which he felt particular interest, as tending to elucidate the geological history of this country, respecting which they contained important information. It was with pleasure that he bore testimony to the

penetration of his friend Mr. Lyell, who long previously had entertained a suspicion that the chalk had formerly extended over a considerable portion of the north-west of Scotland; for, although this actual stratum had not yet been traced, still the approximation to it afforded by the successive discovery of the immediately subjacent beds, combined with the fact that flints containing chalk fossils occurred abundantly on the summits of many hills, distinctly indicated the denudation that had taken place, some traces of which had also been remarked in Scandinavia. In the conversation which followed, several remarkable identifications of Elgin *Ichthyolites* by M. Agassiz, who, unaware of the locality whence they were obtained, had assigned them expressly to particular strata of the south of England, were read from a letter received by Mr. Murchison from Mr. Malcolmson, penned subsequently to the communication of his paper which had been brought forward that evening.

May 9th.—The business of this meeting commenced with the description of a fine vegetable fossil, a species of *Sternbergia*, particularly interesting as being parasitically attached to what was adjudged to be a portion of the stem of a Tree-fern. After this, a communication was read from Mr. Williamson, of Scarborough, being a continuation, or resumed description, of the geology of the adjacent part of Yorkshire. Next, a long and very interesting paper, by Mr. Smee, engaged attention for the remainder of the evening, upon the changes which animal matter undergoes in the process of becoming fossilized. In this it was clearly shown, from a variety of direct observations made upon human bones that had been inhumed for a longer or shorter period, and of which the most ancient had been obtained when digging for the foundations of the cathedral of Old Sarum, together with those of different animals, of various degrees of geological antiquity and of petrifaction, also from carefully conducted experiments upon shells and other animal exuviæ, that the carbonization of the animal (as distinguished from the earthy) matter which they contain, is superinduced during putrefaction, and accordingly affords no datum for determining the relative age of fossils. After the conversation which ensued, Sir Phillip Grey Egerton drew attention to some casts of portions of the cranium of *Mastodon longirostris* which he had laid on the table, and which he suspected to be of the same species as the *Mastodon* of which teeth had been obtained in the English crag, hitherto referred to *M. angustidens*, which latter, he had reason to believe, had never been met with out of India. Mr. Charlesworth bore testimony to the general similarity of the

dentition of *M. longirostris* to English specimens of Mastodon teeth in his possession, but pointed out a slight discrepancy in one respect, and preferred to suspend his judgment for the present, as so little was yet known respecting the crag animal.

MAY 23rd.—Professor Sedgwick read the concluding portion of a very elaborate paper, entitled "A Synopsis of the Series of English Sandstone Rocks anterior to the Old Red Sandstone, and more particularly as developed in the counties of Devonshire and Cornwall." He drew especial attention to the astonishing thickness of the beds, and to the abundant existence of fossils, and of impressions of organic remains, in certain metamorphic rocks of those counties, affirming that the central granite is clearly of less high antiquity than several of the superincumbent fossiliferous deposits. In the very animated and interesting discussion which followed, Mr. Greenough, Mr. Murchison, Professor Phillips, Mr. Lyell, Mr. Stokes, and others, bore prominent parts; and the eloquent and energetic final reply of the eminent Cambridge professor, in reference to various remarks and some allegations that his treatise was in great part devoid of novelty, elicited the most flattering applause and admiration, and rivetted the attention of the meeting to a late hour. Professor Sedgwick descanted at considerable length on the successive discoveries which have been made in British Geology since the publication of Mr. Greenough's excellent map, which he warmly eulogised; and defended the claims of the contribution he had just brought forward to contain much that was quite new to science, although it professed chiefly to be a digest of our previous knowledge on the subject upon which it treated.

JUNE 6th.—A paper by the Marquis of Northampton was first read, in which were described several new species of minute multilocular spiral shells, which his lordship had obtained in one or two localities from the chalk and its flints. Next a communication from J. Taylor, Esq., was brought before the meeting, relative to the quicksilver mines in Mexico, which were stated to be extremely rich, much of the ore yielding forty per cent of metal. At present, however, they were worked to great disadvantage, and not more than half that quantity was extracted from the finest ore. Some native calomel had been found in certain districts. A paper on the formation of obsidian, or mineral glass, contributed by Mr. Edmonds, an officer of the Real del Monte Mining Company, was the next in order: it stated that many layers of this substance, alternating with trachytic sandstone, had been observed, with evident indications of its having been

produced by the partial fusion of the latter. A notice was then read, from Mr. Murchison, of certain rocks in the British Channel, called the Culm Rocks, situate not far from Little Hampton. They consisted of a hard grey calcareous grit, resembling the Bognor Rock, and were deemed to be of the tertiary æra. Dr. Buckland then exhibited some specimens of fossil fishes from the Bagshot Sand, discovered in excavating the Southampton line of railroad. Among them were teeth of Sharks, Rays, and Saw-fishes, and three new genera of bony fishes, which he characterized. These fossils confirmed the opinion that had been previously entertained, of the Bagshot Sand being referrible to the œocene period. Dr. Buckland also exhibited a siliceous fragment of the sacrum of a bird of the size of a Goose, which had been obtained from the Stonesfield Slate. Lastly, an elaborate paper was read by Mr. Stokes, containing descriptions of *Orthoceratites*, chiefly from the neighbourhood of Lake Huron, and some localities in Arctic America, whence they had been brought by the officers of the different arctic expeditions. A long conversation followed, which was sustained till a late hour, in the course of which Mr. Sowerby made several important statements, announcing some curious variations of structure and position in the syphuncles of different chambered shells.

ORNITHOLOGICAL SOCIETY.

MAY 5th.—The Report of the Council stated that the Commissioners of Her Majesty's Woods and Forests had caused some ponds and shallows to be made in the larger island in St. James's Park, in compliance with a request to that effect made to them by the Council of the Society. It further announced that the Duke of Buccleugh had been proposed for election as President, in the room of the Earl of Liverpool, whose term expired on the 18th. W. Holl, Esq., had also been proposed as Secretary, and F. B. Long, Esq., as Treasurer. The followiug noblemen and gentlemen were mentioned as to retire from the Council: viz., His Grace the Duke of Bedford, W. G. Chapman, Esq., the Earl of Liverpool, Capt. Mangles, R.N., and Sir J. D. Paul, Bart.; and the following were named for election in their stead: viz., His Grace the Duke of Buccleugh, Hon. P. C. Scarlett, M.P., F. B. Long, Esq., E. Jesse, Esq., and O. Morgan, Esq.

Mr. Blyth then exhibited specimens of the three wild British Geese

allied to the domestic breed, namely, the Grey Goose *(Anser cinereus)*, the Bean Goose *(A. segetum)*, and the White-fronted Goose *(A. albifrons)*, all which were promiscuously sold in the markets under the general name of "Wild Goose." The first of them was stated to be the primitive stock of the domestic Goose, and to have become of extremely rare occurrence in the British islands, although it formerly bred plentifully in the fens. Until very recently, no specimen of it existed, that he could learn of, in any of the London museums; but aged examples of the Bean Goose, that had the terminal nail *(dertrum)* of the bill white, were ticketed with its name. It differed, however, in various particulars, which were pointed out, and might always be at once told by the pale grey colour of the rump, which in both the others is very dark brown. The Bean Goose was mentioned as the ordinary Wild Goose of these islands, which it annually visits in large flocks, frequenting upland pastures, where neither of the others are ever seen. It was the only species of the three brought to market during the continued severe weather of last winter, when thousands of them were daily exposed for sale. In ordinary winters, the White-fronted Goose is the most frequent species in the markets. Though the Bean Goose had never previously been known to breed when domesticated, it was stated that two females were then incubating on one of the islands of St. James's Park, a fact the more interesting as they enjoyed the full use of their wings. A paper on the Natural History of the Nightingale was next read, after which the meeting adjourned.

MAY 18th.—The Anniversary Meeting took place on this day. The Report of the Council commenced by congratulating the members on the position which the Society had already attained. The number of subscribing members was stated to be 205; a number probably unprecedented in the first year of any other scientific society. It proceeded to remark that it would be in the recollection of many, and more especially of the original members of the Society, that during the commencement of its operations in St. James's Park, great injury was occasioned by the mischief and cruelty of the children and other frequenters of the Park; but the Council had the satisfaction of reporting that a marked improvement in this respect might be observed: and they are convinced that the gratuitous exhibition of living birds will have a powerful effect in combating the childish propensity to tease and torture animals, and in substituting an intelligent interest in the place of an ignorant and brutal cruelty.

Little more than a nucleus of the museum and library had as yet

been formed; but the Council are confident that, with the valuable scientific services of the Curator, Mr. Blyth, a sufficiency of specimens to illustrate the monthly lectures would shortly be obtained. It was hoped that the monthly meetings would continue to prove equally instructive and entertaining, and that the less scientific members of the Society would continue to take part in the conversations which generally succeed the lectures and observations of a more scientific character.

At the conclusion of their Report, the Council begged to recommend to the members and friends of the Society the expediency of enlisting new supporters in its ranks, to enable it to carry out the numerous and important objects of public utility which its prospectuses held out for accomplishment. The Society's operations had hitherto been of necessity conducted on a very limited scale, and a considerable accession of new subscribers was required to empower it to undertake those general projects which would render its existence more extensively advantageous to the community.

His Grace the Duke of Buccleugh was then elected President, in room of the Earl of Liverpool, and the five new members of the Council in place of five that retired from office.

Some admirably-mounted specimens of rare birds were afterwards exhibited by Mr. Blyth, which had been obtained, a few days before, in the London markets. Among them was an exquisitely beautiful specimen of the elegant Squacco Heron (*Ardea ralloides*), in fully adult plumage, which had been shot in Suffolk; and the little Hazel Grouse of continental Europe, the Old World analogue of the well-known Ruffed Grouse of North America, forming with it a distinctly characterized sub-genus, with partly naked legs. The flesh of the latter was stated to be as white as that of a chicken; whereas, in the true Grouse and Ptarmigan, the pectoral muscle was well known to be dark-coloured. Mr. Blyth then discoursed for some time on the general structure of the class AVES, and exhibited analogous portions of the skeletons of various groups, to illustrate the differences which they presented. He dwelt especially on the importance of studying all parts of an animal's structure, in order to attain a just idea of its systematic relations; and expressed a wish that the museum of the Society should be select rather than extensive, affirming that a comparatively small number of species, illustrative of the principal types or models of structure, would amply suffice for scientific purposes, if exhibited in all the progressive stages of their outward covering, and also in the various differential details of their anatomy. N. A. Vigors,

Esq., M.P., followed with some observations to the same effect, remarking how necessary it is for those who desire to advance scientific zoology to penetrate somewhat deeper than the mere surface. Of course no classification could be relied on which was founded on only one system of organs, whether these were exterior or internal; it was on the totality of characters that the natural system reposed, upon the whole rather than a part; and an arrangement based on the entire conformation of organisms must necessarily be permanent, and constitute a secure foundation for extensive generalising.

ZOOLOGICAL SOCIETY.

April 10th.—Professor Owen read a paper on the organs of deglutition of the Giraffe; in which an adequate reason was assigned for the privation of voice in this interesting quadruped. The same gentleman then proceeded to describe in detail the alimentary organs of that extraordinary bird, the *Apteryx* of New Zealand, a specimen of which, in spirits, had recently been presented to the Society by the noble President, the Earl of Derby. The œsophagus was found to be narrow, and destitute of any enlargement or craw; the stomach of small size, and partaking rather of the character of a membranous stomach than of a true gizzard; the intestine was slender, and furnished with large cœca; and the contents of the stomach proved to be the remains of insects, traces of which were likewise met with in the cœca. In short, the general characters presented an approximation rather to the Ostrich and Rhea type, than to that of the Emeu and Cassowary; and it should be remembered that the *Apteryx* also resembles the former genera in the circumstance of its feathers being quite destitute of the accessory plume, which, in the Emeu and Cassowary, attains its maximum of developement in the whole class. Mr. Blyth next exhibited a Duck obtained in the London market during the last week in March, which proved to be the American Widgeon, a species new to the fauna of this country and of Europe. It had been purchased for a variety merely of the Common Widgeon, under which supposition a female of the same species that accompanied it had unfortunately been passed over, though not without some hesitation on the part of Mr. Bartlett, who secured the male. This species is, to a certain extent, mediate in its characters between the Common Widgeon and Teal, having the narrower and more length-

ened bill of the latter, with an analogous (but less defined) green patch on the sides of the head. The specimen exhibited had also a few obscure Teal-like spots upon the breast. It appeared to be a young bird of the preceding year. The tracheal labyrinth was much smaller than in its European analogue. Mr. Gould remarked the interest attached to the circumstance of American birds straying across the Atlantic, and afterwards described a few new species of birds from South America. He then produced two large skins of the Bornean Ourang-outang, one that of a nearly full-grown male, the exhibition of which excited very considerable interest; and Professor Owen remarked that the extraordinary dimensions (seven feet high) ascribed by Dr. Abel to an adult animal of this species, must indicate that the measurement had been taken not from head to foot, but from the extremity of the fingers to that of the toes, in which case, from the great length of the arms, it was probably accurate.

April 24th.—Mr. Waterhouse exhibited the skins of two *Mammalia* from India: the first a species of Mangouste, nearly allied to the *Herpestes brachyurus*, (Gray), from the same locality, but larger and of darker colour, with the tail longer, for which he proposed the name of *H. fuscus*; the other a small *Gerbilla*, which he characterized under the designation *Cuvierii*. A long paper from Mr. Martin was read next, on the anatomy of the Spotted Cavy, of which illustrative preparations and drawings were placed on the table. The affinities of this animal with the *Coypu* and other genera of *Rodentia* were indicated, as deducible from its internal structure.

May 9th.—A large collection of quadruped skins, from the interior of Fernando Po, was laid before the meeting, which had recently been presented to the Society by G. Knapp, Esq. Among them, were no less than seven undescribed species, which Mr. Waterhouse characterized as fully as their mutilated condition would permit of. Of the genus *Colobus*, a remarkable group of African Monkies, destitute of a thumb to the fore-hands, were examples of two; one of them a large animal, with uniformly black and very long hair, to which the name of *C. satanas* was applied; the second was named after Pennant, and differed from the "Bay Monkey" of that author's *History of Quadrupeds* in having the cheeks and throat white, the back rusty-black, the sides of the body bright rust colour, and the under parts dirty yellow. There were likewise two Monkies referable to the genus *Cercopithecus*. For the first Mr. Waterhouse proposed the name of *C. martini*; this species very nearly resembles the *C. nictitans*, but differs in being of a somewhat paler colour, and in hav-

ing a white throat. To the second the name of *C. erythrotis* was applied, from the circumstance of its having bright-red ears; the tail, also, is of a bright rusty-red colour: this animal resembles, in many respects, that known as the Moustache Monkey. A new Genet was then characterized, under the specific appellation of *Genetta Poensis*. It is distinguished from all the previously discovered African species of *Genetta* by its bright yellow-brown colouring, and the greater number of spots and markings upon its body. A new Otter was also found amongst the skins. This animal is smaller than the British species, and of a brighter colour; the throat, cheeks, and sides of the neck, are of a deep golden colour. The last was an Antelope, which Mr. Waterhouse believed to be allied to the Harnessed Antelope (*Antilope scripta*), but the imperfect state of the skin rendered it impossible to assign its affinities with certainty. Like the Harnessed Antelope, it has a black mark along the middle of the back, but is deficient of the white markings on the sides of the body, whence that animal derives its name. The colouring is deeper and richer than that of the Harnessed Antelope, and the neck is of a brownish colour. In addition to the above, a new species of *Cercopithecus*, from Sierra Leone, was characterized, under the specific name of *C. Campbellii*. This animal is of small size, and remarkable for the great length of its hair.

In the course of the ensuing conversation, Mr. Charlesworth announced that he had been informed by the late governor, Col. Campbell, that Chimpanzees are procurable, without much difficulty, from the interior. The large *Colobus* which had been named that evening *C. satanas*, he had the same authority for stating, was by no means rare. It had been found, however, to be extremely difficult of reconcilement to captivity, even when taken young; pining and moaning piteously when confined, and refusing to take any sustenance. Mr. Ogilby then made several observations, particularly to the effect that the stimulus which had lately been given in that quarter was likely to conduce to the discovery of many more novelties in the neighbourhood of the British settlements on the west coast of Africa. Mr. Ogilby then entered into various details on the history of the successive discovery of the different species of *Hypsiprymnus*, Potoroo or Kangaroo-rat; and concluded by characterizing five species that were on the table, which he respectively named *H. setosus*, *melanotis*, *myosurus*, *cuniculus*, and *formosus*.

May 22nd.—The Rev. T. Hope called the attention of the meeting to the ravages committed in various localities on the British coast

by the *Limneria terebrans*, and exhibited some specimens of wood that had been perforated by it under peculiar circumstances. He stated that no sort of wood was exempted from its depredations, and contended for the necessity of constructing metallic piers, which, if properly varnished, will long resist the corroding action of salt water. Mr. Yarrell then exhibited a specimen of an Anchovy which had been taken in a White-bait net that morning in the Thames, being the first instance which he had known of its occurrence in that river, although in the Severn it was not unfrequent, and was numerous around Devonshire and Cornwall. Indeed, so plentiful had this valuable fish been lately ascertained to be in Swansea Bay, and one or two neighbouring localities, that a company was about to be formed for the purpose of capturing it on an extensive scale. It might easily be distinguished from all the ordinary species of *Clupea* by the relative proportion of the jaws, the upper of which exceeded the lower. Mr. Yarrell also related an instance of the Common Herring living for many years and propagating freely in fresh water, where, however, it did not attain a large size, but was very superior in flavour to those taken at sea. Mr. Martin exhibited some species of reptiles sent from the Phillippine Islands by Mr. Cummings, to whom the Society was indebted for many interesting skins of animals, together with some valuable observations on their habits. A species of Iguana, named by him, after the donor, *I. Cummingsii*, was particularly remarkable in having long spinous processes supporting a membranous caudal crest, a character which was observable only in the male. A species of *Varanus* was also characterized. Some skins of *Mammalia* forwarded by the same correspondent were next described by Mr. Waterhouse, who pointed out a new Paradoxure, which was stated to be a great destroyer of poultry, of which it devoured only the bowels. There were three specimens of it, an old male, and two young animals. A Genet, suspected to be new; an undescribed Squirrel; a small but undetermined *Galiopithecus*; and specimens of a Tarsier, formed part of the same collection; and a highly interesting notice of the manners and habits of the last-named animal was read before the meeting. Mr. Waterhouse then exhibited the skins of twelve species of *Mammalia* new to the Society's collection, which, on that account, had been presented by M. Pictet, of Geneva. Among them was a remarkably fine example of the Collared Sloth (*Bradypus torquatus*), which completed the series of that genus, as ascertained at present. The others were, *Stentor fuscus*, *Cebus monachus*, *Callithris melanochia* (three American Monkies), *Chei-*

rodon moko, *Cavia australis*, and *C. rufipes*, a Lemming, two species of *Echymys* (distinct sub-generic forms), and *Cervus rufus* and *C. nemorivagus*, which last appeared to be different from that recognised by the same name in the museums of this country.

JUNE 12th.—An excellent paper was read by Dr. Canter on a new genus of Hooded Serpents from India, which that gentleman had previously characterized in the *Asiatic Researches*, under the name *Hamadryas*. The species exhibited was the only one which he had personally ascertained, although he had received information of two others, which were distinguished by separate Hindoo names. They grew to a large size, and the species to which he drew the attention of the meeting attained a length of twelve feet. It was stated to inhabit hollow trees, and to prey on other Serpents and arboreal Lizards, which regarded it with much instinctive dread. Its power of abstinence is very inferior to that of the Cobras and other allied genera. From experiments with its venom, it appeared that this is less intense than in the Cobras, though still of alarming virulence. It was found to redden litmus paper, and more readily after being kept for a short time; but on keeping it long it became gradually inert, as Mr. Owen affirmed had also proved to be the case with the venom of another serpent with which he had experimented. An interesting account of its habits and mode of attacking prey was then detailed, as personally witnessed by the author; who bestowed on it the specific appellation *ophiophayus*. This notice was illustrated by some admirably executed representations of the anatomy, and of the reptile, taken from life, in the peculiar attitude it assumes when about to seize its prey. Mr. Owen then read a minute description of the respiratory organs of the *Apteryx*, which presented several interesting peculiarities. There were no abdominal air-cells; and the thoracic were separated from the other viscera by a stout diaphragm. The general structure indicated that although this remarkable bird may run very swiftly for a time, as is known to be the case, it apparently could not protract its exertions, but would soon become wearied: considered in this light, its degree of locomotive ability is perhaps lower than in any other of the class. Its nocturnal habits are evidently in accordance with this conformation. Mr. Harvey next exhibited some specimens of fishes and zoophytes procured in the vicinity of Teignmouth; and the remainder of the evening was occupied in discussing the communications of Dr. Canter and Mr. Owen.

*** We hear that the Zoological Society have recently added a young male Ourang-outang to their menagerie, which promises to do as well as the female which has now lived some time in their possession, and continues in sound health. The new-comer is a younger animal, not more than half the size of its companion. Both have been cheerful and lively since their introduction; and their is every reason to look forward to their living to maturity.

CATALOGUE OF THE SPECIES OF THE GENUS CYTHEREA, OF LAMARCK,

WITH THE DESCRIPTION OF SOME NEW GENERA AND SPECIES.

By John Edward Gray, F.R.S.,

of the Zoological Department of the British Museum.

British Museum, 1st June, 1838.

Dear Sir,

As you have been kind enough to express a wish that I should send you a zoological paper for insertion in your useful journal, I have great pleasure in enclosing you a monographic revision of the Genus *Cytherea* of Lamarck, which I have found necessary to divide into several genera, and to which I have added the description of the new species which are in the collection of the British Museum, or in my private cabinet.

Yours, very truly,

To the Editor of "The Analyst." John E. Gray.

Tribe Cythereina.

The hinge with three cardinal teeth in each valve, and with more or less developed anterior lateral teeth.

A. Foot ovate, lanceolate, subanterior; shell ovate.

CYTHEREA.

Shell triangular, solid. Hinder hinge tooth elongated, crenulated. Anterior tooth short, large. Margin entire. Syphonal inflection very slight.

* Two middle teeth of left valve unequal; front one longest, bifid.

Cy. lusoria, Lam. E. M., t. 270, f. 1.
Cy. castanea, Lam. E. M., t. 269, f. 1.
Cy. zonaria, Lam. Chemn. vi., f. 344.

** Two middle large teeth of left valve sub-equal, entire.

Cy. meretrix, Lam. E. M., t. 268, f. 5–6.—the *C. petechealis,* Lam., does not appear to differ.
C. triradiata. Chemn. vi., f. 358.
C. punguis, Gray, *Ann. Phil.*
C. exilis (Venus exilis, Dillw).

*** Front middle tooth of the left valve smaller, narrow; hinder longer.

C. mitis (Venus mitis, Chemn.)
C. casta, Lam.
I have not seen *C. nebulosa,* Chemn. vi., f. 359-361.
Cytherea corpulenta, n. s.—Shell thick, smooth, yellowish.—Umbones white, with zig-zag yellow lines. Hinder slope livid.
Cytherea sulcata.—Shell trigonal, cordate, rather solid, white, with rather deep, regular, concentric ridges. The hinder slope flattened, purple, with small regular ridges.

MEROE (Schum.)

Shell ovate, with a deep, impressed, posterior slope. Edge crenated. Hinder hinge tooth elongated, crenated. Anterior lateral tooth short, strong. Syphonal inflection moderate.
Meroe picta (Venus meroe, Linn.)
Meroe scripta (Donax scripta, Linn.)
Meroe solandri (Cytherea solandri, Gray; *Venus hynans* Solander, Wood, Supp., t. 2, f. 11).

GRATELOUPEA (Des Moulin).

Shell ovate, edge entire. Hinder hinge tooth deeply transversely divided into lobes; anterior lateral tooth short, large. Syphonal inflection moderate.

Gratel. irregularis (*Donax irregularis*, Basterot).

Gratel. hydana (*Cytherea hydana*, Conrad; *Grat. Moulinsii*, Lea.)—*Fossil*, lower tertiary, America, Alabama.

Gr. cuneata, n. s.—Shell thick, wedge-shaped, round, and rather produced in front. The umbones rather behind the middle.—*Fossil*, my collection.

TRIGONA (Megerle).

Shell triangular, edge even. Hinder hinge tooth torn. Anterior lateral tooth elongated, compressed far from the others.

Trigona donacoides (*Venus donacoides*, Gray, Wood, Supp., t. 2, f. 17.

Trigona stultorum (*Venus stultorum*, Gray, Wood, Supp., t. 2, f. 2.

* *With three narrow laminar, sloping, hinder teeth in the right valve; hinder lateral teeth long.*

Trigona Byronensis.—Shell trigonal, cordate, rather ventricose, white, with interrupted brown rays, and zig-zag brown lines on the slope; lunule white; inside white; umbones purple.

Var.—Shell white, without rays or lines.

Inhabits Pacific Ocean.—Capt. Lord Byron.

** *And with two large, oblique hinder teeth in the right valve, inner one largest; lateral teeth short.*

Trigona corbicula (*Venus corbicula*, Lam.)

Trigona ventricosa.—Shell ovate, trigonal, ventricose, pale brown. Hinder slope flattened, very broad.

Trigona planulata, Sow., Gen., f. 2.—Shell trigonal, thin, rather compressed, whitish, with unequal brown rays. Umbones purple with two white rays; inside purple, white-edged.

Var.—Rather wedge-shaped; more produced in front. Inhabits Mexico.—Capt. W. Belcher.

Trigona bicolor.—Shell trigonal, thin, white, pellucid. Hinder slope purple. Inside iridescent. Inhabits coast of Africa.—Capt. E. Owen, R.N.

Trigona lævigata.—Shell ovate, trigonal, rather thin, pellucid, pale fulvous, white varied, slightly concentrically wrinkled.

Trigona angulifera (Cytherea trigonella, Lam., No. 28?—Shell oblong, triangular, thin, pellucid, rather swollen, white, varied with zig-zag concentric lines. Hinder slope purple. Internally purple varied.

Trigona tripla (Cytherea tripla, Lam., 12; *Venus tripla,* Linn., Chemn., vi., f. 330–332.

*** *With a rudimentary rugose hinder tooth in the right valves. Anterior tooth distinct.*

Trigona radiata, n. s.—Shell trigonal, rather compressed, solid, reddish, with distinct darker zones and narrow white rays.

Chione (Gray).

Shell ovate, edge entire or crenulated. Hinder hinge tooth entire, anterior lateral tooth short, conical, close. Syphonal inflection moderate.

Chione erycina (Cytherea erycina, Lan.) *Cy. pectoralis,* Lam., is a variety.

Ch. lilacina (Cyth. lilacina, Lam.)

Ch. tortuosa (Cytherea tortuosa, Sow., Zool. Proc., *Panama.*)

Ch. vulgaris (Venus Chione, Linn.)

Ch. aurantia (Venus aurantia, Chenn.)

Ch. pulchra (Venus pulchra, Gray, Wood, Suppl., f. 16.

Ch. impar (Cytherea impar, Lamk., not Chenn.)

Ch. Kingii (Venus Kingii, Gray, Wood, Suppl., t. 2, f. 9; *Cyth. citrina,* Lamk.?)

Ch. albida (Venus albida, Gmel., List., t. 273, f. 109).

Ch. læta (Venus læta, Chenn. vi., f. 353),

Ch. sulcatina (Cyth. sulcatina, Lam., Chemn. vi., f. 271–72).

Ch. circinnata (Venus circinnata, Born., t. 4, f. 8; *V. guineensis,* Gmel.)

Ch. Dione (Venus Dione, Lin.)

Ch. lupinaria (*Venus lupinaria*, Lesson Cent, t. *V. Dione* β, Broderip.)

Ch. rudis (*Cyth. rudis*, Lam., Poli. Test., t. 20, f. 15–16.)

Chione maculata (*Venus maculata*).

Chione squalida (*Cytherea squalida*, Sow.) California.

Chione Lamarckii.—Shell oblong, subcordate, rather thick, solid, smooth; pale brown, with unequal white rays. Hinder slope punctulate. Lunule lanceolate, purple-brown; inside white, edge purplish. Length 2¼ inches.

Chione apicalis.—Shell oblong, subcordate, rather thick, solid, smooth, yellowish-white, with a few arrow-shaped pale-brown spots above. Umbones red-brown; inside white.

Chione floridella.—Shell ovate, subcordate, rather thin, smooth, polished, with some deep cross grooves on the upper part of the hinder slope. Pale brown, with darker, narrow, articulated rays; inside pale orange, purplish-edged. Front hinge tooth compressed, and close with the others.

Var.—Whitish, with an anterior and posterior very broad darker ray.

Inhabits Africa, the Coast of Guinea.

Chione striata.—Shell ovate, cordate, solid, thick, tumid, rude, concentrically striated. Yellow or orange, purplish behind. Hinge margin rather thick. Lunule ovate, lanceolate, yellow; inside white, purple behind. Inhabits New Holland?

Chione virgo.—Shell subovate, cordate, tumid, rather thick, roughish, concentrically striated. White, apices of umbones rosey. Hinge margin moderate; inside pure white.

Chione purpurascens.—Shell roundish, subcordate, rather thick, solid, smooth; front and upper part of hinder sides with rather deep concentric grooves. Purplish; umbones paler. Hinder slope punctulate; inside white.

Var.—Paler, smoother, umbones concentrically striated. White, with zig-zag brown lines. Lunule purple. The hinder hinge tooth of the older specimens are flat and very rugose. Intermediate between *Cytherea* and *Chione*.

Chione badia.—Shell ovate, subcordate, rather compressed, polished, yellow brown, apex purplish, regularly concentrically grooved. The middle of the lower part smooth, grooveless.—May be the young of *Chione purpurascens*.

Circe (Schum.)

Shell ovate, margin entire. Anterior lateral tooth small, hinder hinge tooth two cut. Syphonal inflection none.

Circe picta, Cyth. picta, Lam. Ency. m. t. 273 f. 2.

Circe castrensis, Venus castrensis, Linn. *V. australis,* Chemn. *Cyth. ornatu,* Lam. *Venus Lorenziano,* Chemn. xi. f. 1961, 62.

Circe scripta, Venus scripta, Lam. Var. *Cyth. undatina,* & *Cyth. plicatula,* Lamk.

Circe divaricata, Venus divaricata, Gmel. *Cyth. divaricata,* and *C. testudinalis,* Lank.

Circe corrugata, Venus corrugata, Chemn. *Cyth. rugifera,* Lam.

Circe gibbia, Cyth. gibbia, Lam.

Circe pectinata, Venus pectinata, Linn.

Circe numulina, Cytherea numulina, and *Cyth. cuneata,* Lamk.

Circe dispar, Venus dispar, Chemn. *Cyth. muscaria, C.pulicaris,* and *C. mixta,* Lam.

Circe arabica, Cyth. arabica, Lamk. *Venus lentiginosa, V. bicolorata, V. arabica,* Chemn. *V. callipyga,* Born.

Circe Crachrodii—Shell oblong, roundish thick, solid, rather ventricose, polished, smooth, with distant concentric grooves in front, and rather irregular striæ behind, White, blotched, spotted and marbled with purple brown, hinder side brown varied, inside rosy, edges brown varied, entire.

In the left valve there is a kind of hinder lateral teeth under the hinder end of the cartilage.

Circe litturata, n. s.—Shell ovate, cordate, rather ventricose, rather solid, regularly concentrically grooved, white or purplish, with angular red brown lines. Umbones smoothish. Lunule lanceolate. Inside white, purplish varied, margin entire.—*My collection.*

Circe crocea.—Shell cordate, roundish rather convex, slightly concentrically grooved. Yellow, with obscure brown lines on the hinder side: inside yellow, edge entire.—*My collection.*

Circe planata.—Shell oblong, subquadrate, rather narrower in front, browner and rounder behind. Compressed, thin, white pellucid, smoothish; very finely and closely concentrically striated; inside white; margin entire.—*My collection.*

Circe sulcata.—Shell cordate, trigonal, rather compressed, solid. Yellow brown, with two or three brown rays not reaching the umbo, finely radiately striated, and with close, blunt, regular, con-

centric ridges, crossed by some obscure curved grooves on the ends. Lunule lanceolate, brown lined, inside rosy white. Margin entire. —*My collection.*

Somewhat like *C. scripta*, but rather more convex, striated, and umbo regular, not flattened. See also *Venus caliste*, Gmel. from Schroet Einl t. 8, f. 8.

Dosina (Gray).

Shell ovate; hinder hinge tooth entire, anterior lateral teeth small, rudimentary syphenal inflection small.

* *Anterior lateral tooth in left valves large.*

Dosina Lamarckii, Venus reticulata, var. 2, Lamk. *V. subrostrata*, Wood, Supp. fig. 7, Ency. Meth, t. 267, f. 7, Chemn. vi. f. 306. *V. subrostrata* of Lamarcks is a different species.

Dosina casina, Venus casina, Lamk. Lin. Trans. viii. t. 2, f. 1. *Venus Rasterucii*, Payraud.

Dosina rugosa, Venus rugosa, Gmel. *V. rigida*, Dilwyn.

Dosina cingulata, Venus cingulata, Lamk. Schroet. Eirl. t. 8, f. 6, 309, Africa.

Dorsina Zelandica, Gray, Yates' New Zealand, 309.

** *Anterior lateral tooth small, sometimes obliterated.*

Dosina veerrucosa, Venus veerruicosa, Linn. *V. Lemanii*, Paraud.

Dosina reticulata, V. reticulata, Linn. *V. corbis*, Lamk.

Dosina puerpera, V. puerpera, Linn.

Dosina Listeri, V. puerpura var., Linn. Sow. Gen. f. Ency. Meth. t. 278, f. 2.

B. Foot broad, lunate, inferior. Shell orbicular, solid, compressed.

Arthemis (Poli.)

(*Orbiculus*, Mergle; *Assa*, Leach, Risso; *Exolea*, Brown.)

Shell orbicular; edge entire. Anterior hinge tooth of the left valve rudimentary Syphonal inflection angular, ascending, acute.

Arthemis excisa, Venus excisa, Chemn. vii., f. 400–401.

A. concentrica, Venus concentrica, Gmel.

A. exoleta, Venus exoleta, Linn. *V. lentiformis,* Sow.

A. lincta, Venus lincta, Maton. *Cytherea lincta,* Lamk.

A. lupinus, Venus lupinus, Poli. *Cyth. lunaris,* Lamk.

A. variegata, V. exoleta variegata, Chemn. vii. f. 407, *V. australe,* Quoy. Vo. Astrol, t. 84, f.

Var. ?—*Cyth. rufa,* Lamk.

A. juvenilis, V. juvenilis, Chemn. vii. f. 405. *V. juvenilis,* Gmel.

A. prostrata, Venus prostrata, Chemn. vi. f. 298. *Venus excavata,* Gmel. Schroet. Eil., iii. 8, f. 10. China, J. R. Reeves.

Arthemis subrosea (Gray).—Yates' New Zealand, 309.

Arthemis ponderosa.—Shell orbicular, rather convex, very thick, solid, heavy. Smooth, covered with a pale, yellowish periostraca; umbones and extremities concentrically grooved. Disk opake white; hinge margin very thick. Anterior tooth rudimentary. Lunule deep, short. Like *A. concentrica,* but heavier, larger, and less grooved.

Arthemis tumida.—Shell suborbicular, convex, solid, rather pellucid, white, with close, fine, regular, concentric, ridges, the altemate ones becoming rather broader on the hinder side. Lunate short, cordate; hinder slope rather short; slightly curved.

Arthemis Bruguieri.—Ency. Method, t. 277, f. 1.

Shell suborbicular, compressed, thin, white, with rather close, concentric ridges; the altemate ones ending before they reach the hinder slope; the front and hinder ends of the larger ones laminar, and forming teeth-like processes on the edge of the hinder slope. Lunule small, cordate.

Arthemis bilunulata.—Shell suborbicular, compressed, pale, whitish, with obscure brown rays, and close, regular, concentric ridges, which are slightly elevated at each end, and form a series of small teeth on the edge of the hinder slope, and others on the edge of a large lanceolate, lunule-like, smooth space, surrounding the small cordate lunule.

Arthemis africana.—Shell orbicular, rather convex, thin, brownish white, rather pellucid, with regular, close, very fine concentric grooves. Lunule short, cordate; inside brownish, polished.—*Var.*—Thinner, nearly smooth striæ, very fine.

Inhabits coast of Africa.—Capt. E. Owen, R.N.

THE MUSICIAN ABOUT TOWN.

UNDER the above title, it is our intention to present our readers with a record of prominent events and transactions that exclusively belong to Music in its scientific and artistical character. Both as a science and an art, Music has, within the last quarter of a century, acquired such an ascendancy in the list of accomplishments requisite to complete an Englishman's education, that we no longer hear the study of it treated as an elegant frivolity by the practical or moral philosopher; or as a pleasing, dexterous attainment, proper to while away a listless hour, by the possessor of aristocratic leisure: or, lastly, as an enervating and engrossing, and therefore dangerous, relaxation, by the man of mercantile pursuit: which last section of the British community, by the way, at the moment of denouncing the fascination of a social concert, could, with an edifying inconsistency of action, devote whole nights of every week to a whist club. Over and over have we heard precise men of business, who have also been persevering card-players, very gravely protest against the allurements of a quartett society, upon the sole ground that it distracts a young man's mind from his mercantile vocation. This prejudice has so far faded away that there is scarcely a periodical work throughout the kingdom that does not devote a portion of its columns to musical intelligence of the ordinary popular class, while many of them, more especially dedicated to a science or an art, nevertheless contain opinions (and frequently judicious ones) upon musical performances, while some assert their pretensions in the science of counterpoint. Even *The Gardener's Gazette* has its musical editor, who speaks "with authority, and not as a *scrub*," upon consecutive fifths and inconsequent resolutions. Various circumstances have conspired, within the present century, to improve the naturally fine character of the English; but nothing has contributed so effectually to soften, without effeminizing, the national manners, as the increased and increasing cultivation of the science of Music. The springing up of choral societies all over the country—more especially in the dense manufacturing districts—is the result of this improvement in taste. The same effect may be observed in London, where the amateur-choral societies are multiplying and increasing to a remarkable and satisfactory extent. The performances of the "Sacred Harmonic Society," at Exeter Hall, now hold an important station in the rank of metropolitan recreations; and the prospect of its three or four hundred members, almost all of them mechanics, or

persons engaged during the day behind their counters, performing at night the most lofty compositions of the great musical epic writers, is an object worthy of admiration, and doubtless is producing a beneficial effect upon the thousands who come to improve their moral and intellectual perceptions by listening to those divine homilies. It has frequently been remarked, but with what truth we need not here determine, that the lower-middle class of English society are not merely leaving—that they have already *left*—the aristocracy leagues in the rear upon all questions of intellectual refinement. The Italian Opera of London is one example in confirmation of this remark, as regards the cultivation of Music. The compositions listened to night after night by our aristocracy, with so much complacency, at Her Majesty's Theatre, are confessedly, as works of invention and imagination, of the most ephemeral character. Were it not for the brilliant organs which give them utterance, they could not be endured for a night. The majority of that audience estimate the music by the singer of it. They go to hear the trills and flourishes of Rubini, and the *modern* opera: but the singer is the main attraction. Upon a non-subscription night, however, if an opera of Mozart's be put up, the house is notoriously filled by the middle ranks of society; and the organ of "the fashionable world" amuses its dainty readers by expressions of horror at the vulgar complexion of the pit audience. The foreigner who should estimate the English taste for music by the compositions performed at the Italian Opera, would make as erroneous a calculation as if he were to judge of our progress in mechanism and fine art by the prizes distributed at some of our public institutions for unmeritorious inventions, and flowers and butterflies painted on vellum. It is to the private societies the foreigner must go, to perceive what progress classical music is making in this country: to the quartett and quintett parties, public as well as private; to the societies which meet for the practice of the Masses of Haydn, Mozart, Beethoven, Cherubini, and Hummel. He should observe the audiences at these meetings; at the Sacred Harmonic Society, the Sacred Choral Society, the Classical, City Classical, and Choral Harmonists; at the Quartett and Classical Concerts; at the pianoforte soirées of Moscheles and Neates: at all which meetings music is now listened to and evidently relished, which five and twenty years ago would have been laughed at, or performed to empty benches.

All these are indications of the prevailing taste for good music. The very circumstance of the *amateurs* having forced the reproduc-

tion of Beethoven's choral symphony, which at its first performance (twelve or fourteen years ago) was utterly uncomprehended, and therefore utterly marred, is another "sign of the times," and should indicate to the members of the Philharmonic Society the necessity of appointing directors prepared to go hand in hand with, if not to be in advance of, the age. This must be done, or that society will lose its well-deserved supremacy in our musical republic. Another indication of the onwardness of Music in England is, that a society is at the present moment forming, the object of which is to facilitate the introduction of music in schools, to the extent required for teaching its elementary principles; and this is proposed to be effected by the means of tracts and other cheap works, and by lectures. To provide teachers for singing, and the notation of music. To assist in forming choral societies throughout the country, more especially without instrumental accompaniment, on account of the expense of such addition. The reputed judgment and known predilection of Her Majesty for a science so calculated to soften and refine the manners of her subjects, will, it is hoped, prompt her at once to become the patroness of so meritorious a plan.

In proceeding to our proposed summary of the metropolitan performances, courtesy rather than justice demands that the Italian Opera should take the precedence. With a company and an orchestra that were probably never equalled in this country, the subscribers, up to the present time, have been supplied with less novelty than during any former season within our remembrance. Bellini and Donizetti have been the twin buckets in the well. Mozart, indeed, has three times inundated the house with his Don Giovanni, and every nook was occupied with grateful recipients of that eternal fountain. Donizetti's "Lucia di Lammermoor" was the first novelty, and owed its success (if such it might be called) chiefly to the masterly singing of Rubini; who was called upon to repeat the finale, although he kills himself! There can be no question that Donizetti has a genius for melody; but he appears not to have even an idea of dramatic effect. His operas are usually compounded of a hurly-burly of brass and blare, interspersed with a cavatina or two of graceful character. This alternation of noise and prettiness is the recipe from which the modern Italian composers manufacture their dramatic works. Donizetti is successor to Zingarelli in the Conservatorio at Naples, and, it is said, ranks with the first theoretic musicians of the present day; but that he wants judgment in the ordering of his orchestral effects must be acknowledged, from his eternally employing the full band, down to the great brass in-

struments, in the accompanied recitatives and solos, where effect and vehemence are not looked for. The critical ear is, therefore, continually annoyed with an anticlimax of fierce appeals without adequate motive, and mere noise unattended by dramatic passion. The case appears to be that these full orchestral effects are solely intended to produce so many reliefs to some pretty, unassuming cavatina. Donizetti evidently writes purely for money, and, by report, will finish an opera "to order," upon any subject, in six weeks. He is still under fifty years of age, and has written more than that number of operas. This is not surprising. Mr. Bulwer, or any other novelist, could produce romances quite as rapidly, if the public would be contented with a fiftieth repetition of the same thoughts recorded upon the arithmetical principle of permutation. All the phrases in the finale to the 'Lucia' have been heretofore so frequently repeated by the author that it becomes a task to retain one's attention to them. Nor, indeed, do the audience pretend to do so; they are hanging upon Rubini's tones. The "Parisina," by the same composer, is still less attractive, both in dramatic and musical pretension, than the former production. To the lover of the pure school of operatic writing, the compulsion to sit through a performance like that of the "Parisina," is exasperating work.

Mad. Persiani, the only addition to the company of this season deserving of record, made her first appearance in this country in the "Sonnambula," upon the re-opening of the theatre, March 23rd.—Her voice, which is a high soprano of considerable compass, brilliance, and flexibility, is rather defective in mellowness and weight; and we are inclined to think that this has arisen from an over-exercise of the organ, in order to attain the mastery of those surprising instrumental passages which she executes. Hence she has attained the complete command of the most distant as well as difficult intervals; and these she delivers with great freedom, and an absolute correctness of intonation. Moreover, Mad. Persiani sings like a musician, as well as with tasteful and mechanical refinement; for, upon the occasion of repeating a solo, she usually varies her embellishments and cadenzas, and always to the satisfaction of the most fastidious judges. She is wife to the composer of "Ines de Castro," the principal part in which opera was written for Malibran. She is likewise daughter of the celebrated tenor, Tactrinardi; and, to conclude our account of her, we have much pleasure in witnessing the steady increase of her popularity in this country; for we believe there is no doubt that much unworthy partizanship has been excited against this highly accomplished and estimable artist.

At Drury Lane Theatre, the operatic department has signalised itself by one reproduction and one novelty, both creditable to the orchestral and vocal resources of the establishment; and, as they deserved to be, both were successful. These were, Mozart's "Zauberflöte," and "The Gypsy's Warning," the music composed by Signor Benedict, pianist to the King of Naples. The story of "The Magic Flute," which, in its original state, can be compared only to the delirious dream of a German enthusiast; love, incantation, the Egyptian ritual, and mere buffoonery struggling on in admired perplexity, was reduced to something like common sense upon the present occasion; while the performance of the music was, upon the whole, respectable, the concerted movements scarcely so throughout. Miss Romer was the Pamina; Mrs. Seguin, as the Queen of Night, distinguished herself in the beautiful scena, "Non paventar" (we do not remember the words of the English version); and Phillips, although inferior to Dobler in the part of Sarastro, sang the "Qui sdegno," and "Possenti Numi," with exquisite purity of style and devotional feeling. Balfe and Giubilei, in Papageno and the Ethiop Monostatos, were equally zealous, and deserve honourable mention. The great drawback from this very creditable reproduction was the singing of Mr. Templeton, in the part of Tamina. Inefficiency with diffidence at once makes an appeal to the acerbest of critics: when we even suspect that the latter quality accompanies Mr. Templeton's deplorable ignorance he shall derive (from at least one of his critics) all the advantage of a generous consideration; but it were a misprison of justice to pass over his delivery of the exquisite aria, "O cara imagine," to say nothing of the alteration of Mozart's passages upon other occasions.

Mr. Benedict's opera would, in all probability, have retained a longer reign of popularity, had its plot been more interesting and less confused. The composer, who is a pupil of Weber, was already known to the English public as the author of some elegant songs; considerable expectation was, therefore, excited from the production of his opera, and neither the scientific musician nor the amateur was disappointed. Mr. Benedict has a thorough knowledge of the resources of an orchestra, and he may, perhaps, be charged with availing himself somewhat ostentatiously of those resources, almost to the suffocation of his melody. This objection, however, does not hold good as connected with the duets "Tell me, youth," and "Oh, do not give way!" which, being distinguished by gracefulness of design, are chastely and soberly accompanied. Among the concerted movements, "The Students' Glee," "Blest be the Home," and

"Welcome back the sweet Spring-time!" are the most popular; the former having been encored at every performance. The songs "He comes not yet" and "Scenes of my youth," are clear in outline, delicate in construction, and expressive of graceful and gentle emotion." Two other solos, sung by Phillips and Seguin, appear to have been addressed to "the groundlings," and they did not fail in their aim; for, being noisy and vulgar, they were duly appreciated, and unduly honoured. The same report may be made with regard to the overture, which, although perhaps the least meritorious of all the music in the piece, was tumultuously encored at its first performance.

In addition to his accomplishment in the theory of his art, Mr. Benedict is not surpassed (we might say equalled) by any professor before the public, in that rare but very valuable acquisition, the being a judicious accompanyist. He truly *waits* upon the voice, and with such exquisite tact, keeping the instrument ever subordinate, and watching the singer with so constant an assiduity, that the betrayal of a blunder must be an act of wilfulness on the part of the latter. In this delicate accomplishment we have never met with his equal, except in the late William Russell, organist of the Foundling, and Mr. Novello, both of whom were consummate accompanyists.

Having previously stated that only one "novelty" has been produced this season at Drury Lane, we were not unmindful of Mr. Balfe's opera of "Diadeste," which, having been brought out in great haste, and being, moreover, little better than a repetition of the composer's reminiscences of modern Italian phrases, it can scarcely claim the merit of *novelty*. Mr. Balfe's deficiency in original thought being so palpable as to be universally acknowledged, it is to be regretted that this clever and intelligent musician (which he certainly is) should sacrifice his interests so far as to scramble together and botch up, at a week's notice, the crudities of a flimsy school, however fashionable.

Mr. H. Phillips also produced, at his own benefit, an unpretending opera, entitled "Harvest Home," the words and music by himself. It was not favourably received; but as a courteous tolerance is always observed towards the productions of an artist at his own benefit, some of the critics in the daily press were doubly ungracious in treating with uncalled-for severity the praise-worthy attempt of a singer whose appearance before the public is always attended with welcome and approbation.

Since the production of Rooke's delightful opera of "Amitie" last year, no work of importance has been brought forward at the Covent

Garden Theatre. Auber's opera of "Le Domino Noir," got up in haste, enjoyed but a fleeting and ricketty existence. Mr. Macready is not yet sufficiently the philosopher to estimate music at its full moral and intellectual value. He considers an opera as useful only to the tragedian, that, like the symphonies between the acts, he may have breathing time, and the audience may recreate their travelled spirits: but that those mysterious combinations of sound constituting harmony with melody, should, according to their various character and construction, act upon the gentler or fiercer of human passions, he entertains, as we understand, not a shadow of belief, because (of course) they make not the remotest appeal to his own senses. Consequently, this characteristic indifference to music influenced his conduct as the interested manager of the theatre, and "Le Domino Noir" was hurried before the public with as little care as would be bestowed in arranging a procession in a tragedy. "The Out-post," an operetta, re-written by Serle from a French drama, the music by Hullah, had more care bestowed upon the bringing forward, and it met with a better reception. The character of the music being principally martial, it is not, we think, in Mr. Hullah's vein, whose taste and tendencies are of the gentle and placid kind. If we except a little straining after novelty in phrasing his motivi—especially when their prevailing features are not absolutely original—he is a pure and elegant melodist; and his concerted music is usually designed and conducted with freedom of manner, and in strict conformity with his dramatis personæ; while his orchestral accompaniments are rich and varied in colour, and never predominant and overpowering.

The Philharmonic Society, who naturally take the lead in the metropolitan concerts, have this season strengthened their orchestra with two additional violins, Messrs. Guynemere and E. W. Thomas, Willy and Marshall having joined the ranks; all valuable acquisitions; the veteran and respected Weichsel, with Mr. Dance, having withdrawn. Dando has been transferred to the tenors; another judicious move, for he is a superb tenor player; and that department of the band has been needfully strengthened by the addition of Alsept, Pensam, and J. Banister. His brother, H. J. Banister, who is an honorary member, and an accomplished violoncellist, should, if possible, be squeezed in, with at least one more double bass.

The first concert, which took place on the 4th March, was one of the richest in selection of the season. Mozart's Jupiter and Beethoven's Eroica were the symphonies performed. The solo perform-

ances were, Mayseder's second concertina for the violin, admirably executed by young Blagrove ; and Mendelssohn's Piano-forte concerto in D Minor, which he himself played at the last Birmingham festival, by Mrs. Anderson. Unlike a large bulk of modern piano-forte compositions, the concertos of Mendelssohn are so thoroughly the result of large thought, with exquisite taste and feeling, that the performer has made but a small advance towards compassing the author's intention, who shall only have mastered his passages, severe as this task undoubtedly is ; for not only must the performer be imbued with a knowledge of the greatest schools in music, fully to appreciate his author's ideas, but should at the same time possess a refined as well as sensitive organization, to give them due expression. Mendelssohn is now the bright star in the ascendant, and there is little doubt that each coming year will confirm this opinion. His music is of that character which dilates in the mind with reiterated acquaintance, a result with is signally observable in studying his magnificent oratorio. Mrs. Anderson's performance of the concerto, upon this occasion, somewhat disappointed the audience, and distressed her friends, who knew beforehand that she had been the whole day previous so much indisposed as to have entertained the thought of declining to play at all that evening. The lady, however, made ample amends for the untowardness of this casualty, by repeating the composition at her benefit concert, when she performed with as much vigour, self-possession, accuracy, and feeling, as we ever remember to have seen in her.

The symphonies at the second concert were the Nos. 8, both of Haydn and Beethoven. After these the distinctive features and novelties of the evening were, a clarinet concerto by Mozart, apparently an early composition, performed by Willman ; a quartett of Beethoven, in D, by Loder, Watts, Tolbecque and Lindley ; and Mendelssohn's overture to the "Isles of Fingal." The second and last movement of the concerto, but especially the former, the andante most generally pleased : the first we thought not only too long, but the passages seemed too frequently repeated, and too much of the same character. Willman's playing was what it invariably is, a lesson to every solo performer, whether instrumental or vocal ; instinct with neat execution and refined sentiment. It were difficult to imagine a more perfect union of tone with feeling of the author's intention than was displayed throughout the quartett, but these were so eminent in the andante that the whole audience gave vent to one simultaneous burst of approbation. Tolbecque, the tenor's reading of this movement could only have been the result of

an accurate knowledge of his author's intention, with an exquisite taste in expressing it. "The Isles of Fingal" will be more fully appreciated, as the poetry of the design, with the composer's meaning, become known. It will then be classed among the greatest efforts of musical description and painting.

The novelties at the third concert were Spohr's symphony in C minor, No. 3; (No. 2 of Mozart opened the evening's performance) Moscheles concerto pathetique; and Beethoven's overture to "Coriolan." The first movement of Spohr's work is elaborate, with, we think, too apparent a display of learning: the andante, delicious in its subject, is in the instrumental treatment one of the most lovely specimens of orchestral writing that we could refer to. The finale, although worked in the most close and masterly way, will perforce remind every hearer of the last movement in Beethoven's D major. With all his mannerism and self-repetitions, Spohr ever and anon makes so direct an appeal to one's sympathies, that we feel disposed to throw all his egotism into the back ground. Moscheles' concerto, one of immense difficulty, did not impress us with the idea of the author's proposed design; its general character bearing little of the "pathetic" either in subject or detail. We speak from a single hearing, and under other disadvantages. Moreover, the composer must have been dissatisfied with his own performance, for his instrument seemed but sluggishly to answer his fingers. Beethoven's overture to "Coriolan" is a rousing and noble composition. Every bar of it contains proof of the energetic, self-willed, Pindaric imagination of that wonderful writer. It was played as the Philharmonic band ought to play such a production.

The fourth concert was signalized by the second performance of Beethoven's choral symphony, or "Sinfonie caracteristique;" the first having taken place only last year; for the attempt made in 1825, and which we witnessed, should, if possible, be blotted out of the Philharmonic records. Every thing was against it. The band had not had sufficient rehearsals, (and they should have had twenty) and some of the grave authorities in the profession, who judged of the author's design through a miserable rehearsal or two, pronounced the whole work to be an eminent specimen of "the aberrations of a great mind." Till the last year, therefore, it had been thrown aside, and would, in all probability, have been to this hour classed with the other miscalculations of wild and irregular geniuses. The directors of these concerts, we firmly believe, would not have attempted its resurrection had it not been for the unremitted enquiries, demands, and goadings of several distinguished amateurs, assisted

by the higher members of the profession: and it is but justice to state, that among the former, the most efficient in his exertions was Mr. Gauntlett, who, by the means of his own pen in the pages of "The Musical World," and by enlisting other periodical writers on his side, induced the society to give this most stupendous effort of Beethoven's genius a full and fair trial. With good judgment, therefore, they selected Mr. Moscheles to be the conductor of it, who had so perseveringly studied the score as to know every feature by heart, and consequently was qualified to direct the band in their full developement. The performance, upon the present occasion, was more uniform and steady than last year, and a decided improvement throughout was manifest. The scherzo was taken somewhat more slowly, the andante rather faster, and in both instances we felt the alteration to be advantageous. Mr. Loder, the principal violin, was as firm as a rock. He had also made himself master of his author's score, and the result was, that a complete understanding was established between him and Mr. Moscheles, who has so completely identified himself with this extraordinary production that he will doubtless preside at its repetition every future season; for the Philharmonic directors will now as soon think of omitting the Jupiter as the No. 9 of Beethoven. Two solo performers also appeared for the first time in this country at the same concert. Hausman, a violoncellist, and Heinemeyer on the flute. The former possesses great command over his instrument, and his composition, which was well put together, proved him to be more than a mere mechanist. His tone, however, was feeble and *comby* in its character. Mr. Heinemeyer, in this latter qualification, left nothing to be desired; although in no one respect should we esteem him to be superior to our own first flute, Ribas.

At the fifth concert the symphonies were, Beethoven's magnificent C minor, and Haydn's No. 7. The solo performances were, a posthumous M.S. Concerto of Hummel, played by Mad. Dulcken; and a Quartett of Spohr, by E. W. Thomas, Watts, Tolbecque, and Lindley. The former composition will rank with the best works of that great master. Like all the writings of Hummel, it is most charmingly scored, and is replete with delightful melody and rich colouring. The andante is our favourite movement, and the Russian air is as novel as it is sparkling and vivacious. Mad. Dulcken has an extraordinary finger, and her playing is brilliant and energetic: her *forte*, however, rather displays force and vehemence than power, and to awe feeling she is deficient in the expression of tenderness. We could not avoid the reflection how the composer him-

self, or John Cramer, would, as it were, have yearned over that sweet slow movement, and how Moscheles or Thalberg would have fired the train of the finale. Mad. Dulcken *knocked out* those iterated notes in the subject as if she had a spite against them. Add to these objections the lady is accustomed to hurry her time. Mad. Dulcken has her merits, and considerable ones they are; but when injudicious people pronounce her to be "the finest player in Europe," it becomes requisite to refer to the *finest school* in the art, and institute comparisons. Mr. Thomas, in the quartett, drew our attention almost exclusively to himself. His style and execution are both excellent, and his tone sweet, but so gentle in character as to be scarcely sufficient for a large concert-room. We can believe him to be a delightful chamber violinist. The composition was a perfect specimen of the learned mannerism of Spohr, and tedious to the very verge of endurance. Mrs. Shaw's singing of Beethoven's grand aria, "Ah perfido," was perhaps the best vocal performance of the season at these concerts; which, at the same time, we acknowledge to be no compliment to the lady, for it has been much below par.

Beethoven's "Pastorale," and the divine E flat of Mozart, were the symphonies selected for the sixth concert, and they were performed in the most perfect style imaginable. The principal feature of this evening was the first appearance of Doehler, the new pianist. He performed a fantasia of his own upon subjects from the "Guillaume Tell." From the specimens we have hitherto heard, we entertain not the most favourable impression of this really eminent artist's talents as a composer; and indeed all the time he was exhibiting his amazing mechanical accomplishment, we could not but regret that so much exertion should be thrown away upon music certainly unworthy of it; and indeed people begin already to weary of these eternal variations upon commonplace motivi. As a performer, however, Doehler is indeed a surprising artist. Brilliant, graceful, delicate in style and manner, with uncommon power and dignity. His manner of conducting his subjects in chords with the left hand in accelerated time, while a torrent of notes in accompaniment are proceeding with the right, forms one of the prominent features of his performance; and another is, the manner in which he contrives to maintain the subject floating above the torrent, without unnecessarily thrusting it into notice, is another characteristic of that wonderful command of finger and self-possession which distinguishes Thalberg's school of piano-forte playing; whom, we think, Doehler equals in all repects, excepting that perhaps the

former has a grander style of delivery. It is needless to say that Doehler's exhibition was succeeded by a storm of applause.

Mons. Auguste Pott, a distinguished violinist, and a pupil, we believe, of Lipinski, also made his debut in this country upon the same evening. He performed his master's concerto in B minor. Mr. Pott is, we should suppose, almost without a rival in the mastery of the difficulties on his own instrument; for the coolness with which he executed his double stops, sixths, octaves, and tenths, was as remarkable as were his neatness and precision. The quality of his tone is inferior to that of De Beriot, but, we should think, greater in power; while in grace and delicacy of expression he is unquestionably inferior to that enchanting artist. On this same evening was performed, for the first time, an overture by Mr. Guynemer, an associate of the Society, entitled "The Exiles." By selecting this composition, and rejecting Mr. Potter's overture to "The Tempest," a composition by Kalliwoda, one also by Müller, an overture by Lindpaintner, and another by Onslow, the directors have placed themselves in the awkward dilemma of having preferred a composition greatly inferior to any of those named, and consequently that they are incompetent judges of merit, or that a spirit of intrigue and favouritism has arisen, and been allowed to prevail, in the council of direction. Suffice it to say that "The Exiles" ought never to have been heard after the trial-night of the Society; for it was not worthy of the author, who is a musician of real ability, and an accomplished violinist.

Spohr's grand characteristic symphony, "Die weihe der Töne," formed the principal novelty of the seventh concert. Haydn's Letter V. opened the second act. The former is a musical illustration of Pfieffer's poem, the "Ode to Sound," wherein the musician has, in almost every movement, overlaid his subject, and constantly repeated himself. Subjects from his operas, from the "Jessonda," and "Azor and Zenuira," floated before us like theses ramified into elaborate disquisitions. And indeed, to speak the honest truth, in scarcely more than one instance could we realize the author's intention, although a translation of the poem accompanied the programme of the concert. Not only, also, has the composer mystified his subject to the hearer, but to the performers he has needlessly laboured to accumulate difficulty upon difficulty; so that it would be a positive wonder to hear it executed correctly. Mr. Potter, the conductor, did his best, but how he was to direct an orchestra in a movement composed in triple, dual, and monal time, it were hard to imagine. Here, therefore, the wind instruments were all abroad,

and the performance upon the point of going to pieces. What our opinion may be when we become as acquainted with the author's design and treatment as the band ought to be, we pretend not to say; but upon this, a second hearing, we hesitate not to avow that the excessive wire-drawing of his subjects fairly wearied us out. The other novelties in the concert were, a fantasia on the contra-basso, by a Sig. Müller, and a concertante for flute and oboe, by Ribas and his brother, a young lad. The music of Mr. Müller was positive trash, his performance more than respectable, and his tone feeble. In style and finish, Ribas is a delightful flutist, and his brother will be a most eminent player. In his present state of advance to perfection we have never heard him exceeded for steadiness of time, beauty of tone, and precise with neat execution. In feeling and delivering his phrases he reminded us of the exquisite cantabile of Willman. Having noticed the most creditable vocal performance of the season, we are in duty bound to signalize the reverse specimen, as much from its being a curiosity in its way, as to convey a censure upon the directors in allowing such an exhibition to pass, having heard it at rehearsal. The "Soave sia il uento" was sung by a Mad. Shrickel, Miss Hawes, and Mr. Phillips, and on the part of the soprano was so ingeniously spoiled, from the second bar to the close of the piece, both in time and tune, that the audience in all directions testified their sense of the insult The last concert of the season had not taken place when our number went to press. Want of space also prevents due notice of the other metropolitan concerts, which shall be supplied in the October number.

PROCEEDINGS OF PROVINCIAL SOCIETIES.

BIRMINGHAM LITERARY AND PHILOSOPHICAL SOCIETY.

At the commencement of the fifth session of this Institution, on the 7th of May, 1838, William Wills, Esq., the President, delivered an eloquent and instructive Address, of which the following is an abstract.

Gentlemen,—I request the favour of your indulgence for a few moments, while, pursuant to our usage, I take a brief review of the

proceedings of the Society during the past year, and offer one or two observations upon its objects and future prospects. This periodical retrospect, when we arrive at the key-stone which separates the past from the coming year, prudence dictates to societies not less than to individual men.

On the first evening of the session, our esteemed and indefatigable secretary, Dr. Ward, whose removal from amongst us we must all regret, delivered a very interesting and instructive paper, which has since been printed in a respectable periodical, the ANALYST, upon that extraordinary remnant of antediluvian life, the Ichthyosaurus. When it is considered that the only unerring indications of the antiquity of the strata which compose that part of the crust of our globe with which we are acquainted (excepting some fragments of older strata) are derived from the animal and vegetable remains which they contain, it is astonishing that, by the aids of comparative anatomy and analogical reasoning, upon a basis apparently so inadequate, so solid a superstructure as Geology now presents has been raised. At the talismanic touch of the immortal Cuvier, the scattered facts relating to this branch of knowledge assumed the symmetry and coherence of science; and his labours have been ably followed up by many illustrious men, and particularly by our distinguished countrymen, Mr. Lyell, Professor Sedgwick, and Dr. Buckland. In its infancy, Geology had to struggle against uncommon difficulties, arising from gross ignorance, and the most perverse misapprehension of its objects and its tendencies. Some of the opponents of geological truth, by their virulence and intolerance, remind us of the Brahmin who, seizing a stone, crushed to dust the microscope that first showed him living things amongst the vegetables of his daily food. Surely the laws of Nature and of material phenomena can never speak other language than that of eternal truth. It has been justly said that "conflicting falsehoods we can comprehend, but truths can never war against each other;" and that "we have nothing to fear from the results of our inquiries, provided they be followed in the laborious but secure road of induction."

At its next meeting the Society was favoured with a paper by Mr. William Hawkes Smith, entitled "On Meteoric Stones, principally with a view to a Shower of Talc, which fell in 1807." This paper led to a lengthened and interesting discussion upon the various conjectures which have been advanced to account for the origin and formation of meteoric bodies, all of which seem to be attended with some startling difficulty. Until of late the most plausible hypothesis was considered to be that which attributed the descent of these bodies to a projectile force at the moon's surface; and the necessary velocity has been computed to be that of three times the swiftness of a cannon ball, which would bring such a body to the earth in two days and a half. But it seems difficul to account, on that hypothesis, for the generation of the great heat with which the descent of meteoric stones is attended, to say nothing

nadir as in their zenith. Philosophers at present seem inclined to the belief that vast quantities of unconsolidated particles and small masses of matter traverse space, and, impelled by some projectile power, or by attraction, continue to move until they approach the earth or some other body; a notion which is corroborated by the recently observed periodical appearance of meteoric bodies near the close of the year. But against this hypothesis there are, nevertheless, considerable difficulties. The similarity of the constituent ingredients of talc with those of such meteoric bodies as have been subjected to analysis, is a remarkable coincidence; though it is to be regretted that the actual descent of that substance was not witnessed.

Mr. Follett Osler's "Review of the Meteorological Changes during the first half of the year 1837, with Illustrations from the Tables obtained by the use of the Self-registering Anemometer and Rain-gauge," excited great and deserved interest. Although the great agents of meteorological change have long been known, the science, at least in some departments, has made but slow advances. Nor is it to be wondered at that, invisible and impalpable as some of its elements are, they should long have eluded accurate observation. But with the perfection of instrumental aids, this interesting department of natural science will probably assume a certainty and perfection to be anticipated only by those who know what has been accomplished by diligent and patient observation in other branches of knowledge. Amongst other desirable results, a series of observations continued by these means for a sufficient length of time, will probably give a series of graphical curves representative of something like a cycle of the wind at particular places, and lead to generalizations applicable to objects of great social importance. Some curious and valuable practical results have been obtained by the observation of the phenomena of storms and hurricanes in the West Indies and on the coast of the United States; and the tracks of many of them have been laid down, and found to be, in general, portions of an elliptical or parabolic circuit, whose vertex is uniformly found to be in or near a certain latitude.

Mr. Francis Clark's "Observations on some Official Statistical Returns, with Hints for the Collection of Statistical Data," presented us with much curious and valuable information, and offered several important suggestions in the compilation of tables and returns. This branch of science is now attracting its fair share of notice; and the amended form and greater accuracy of the tables which have of late been published by authority, attest the prevalence of a more correct estimate of the importance of statistical science in all its details. Statistical knowledge is eminently important in its practical application to the moral and physical exigencies of society. It is a great recommendation of this branch of knowledge that though, to the superficial observer, its details may seem to consist of disconnected facts, irreducible to any stable principle, they are really subject to general laws as fixed and immutable as the law of gravitation. I have often thought of it as a practicable matter that

the actual elements of social condition may be reduced to certain formulæ, capable of easy and natural comparison with similar expressions applicable to the condition of other countries; exhibiting the various forms, if not exposing some of the causes, of national prosperity and revenue, and suggesting the remedies of some at least of the incidental evils of social life: a noble application, indeed, of statistical science!

On a subsequent evening, Mr. Dawes gave the Society an account of a new and important mode of applying hydrogen gas, in the manufacture of iron; being, in fact, an application on a great scale of the principle of the blow-pipe. The object of Mr. Dawes's improved process is, to produce a purer and better commodity by preventing the oxidation incidental to the blast, which is at present so prolific a source of waste, both as respects fuel and metal. It is an extraordinary circumstance that Great Britain is still obliged annually to import large quantities of iron, for the purpose of conversion into steel. Every thing that concerns the improvement and commercial production of this great national staple, which shall obviate or diminish the casualties which seem inseparable from the present mode of manufacture, is of great general as well as local moment; and I am sure the Society will be thankful to receive from Mr. Dawes the results of his later experiments upon a process which, though promising, had not, at the time he delivered his paper, fully realized his expectations.

Having taken this imperfect review of the proceedings of the past year, I will detain you only a few moments longer, while I recal to your attention the leading objects and probable prospects of our association. It is a happy effect of societies like this to bring together, for the prosecution of a common object, men of different pursuits and professions, who upon other matters hold various and conflicting opinions, which too often operate as a principle of repulsion. The co-operative principle, so important as a stimulus in associations for other purposes, commercial, benevolent, or political, cannot but be an important auxiliary in associations like ours. Our institution makes no lofty pretensions; its members are attracted from the ordinary paths of social life by the conviction that knowledge is the only imperishable possession, and by a mutual desire to learn and to communicate; in short, to assist in concentrating some at least of the scattered rays of mental light.

Let it not be objected that these ends are to be effected only by the favoured Aristocracy of Nature, upon whom has been conferred the splendid endowment of intellectual superiority. Some of the greatest achievements of the human mind have been made by men not raised above the common level of their race. What is all philosophy but a search after happiness, vith a view to make it the subject of deductive generalizations applicable to the advancement of human happiness? It was the profound observation of that illustrious man, Sir Humphrey Davy, that "the knowledge of the philosopher differs from that information which is the fruit of common experience not in kind,

but in degree;" and that "the object which the philosopher aims at in his researches is precisely the same with that which every man of plain understanding, however uneducated, has in view when he remarks the events which fall under his observation, in order to obtain rules for the future regulation of his conduct." It is true that it is not every observer, however accurate, who can thread the maze of consequences which are often perceived at a glance, by the gifted mind to result from a single fact, like Clairant, who, from some perturbations in the motions of certain of the planetary bodies, conjectured the existence of a seventh planet, and the position of its orbit, many years before it was discovered; but the great provinces of observation and experience offer some rewards to all who to common diligence unite a desire to taste of the fruits of knowledge.

Again, some of the noblest conquests of science have been nothing more than applications and adaptations of known natural principles, or inferences which astonish by their very simplicity, from facts patent to every observer. Thus, the same principle explains the descent of bodies to the earth's surface, the ascent of vapour, and the motions of the planets. The oscillations of a lamp in the cathedral of Pisa, a phenomenon seen by numberless spectators before, suggested to Galileo the isochronism of the pendulum, and led to the observation that a long pendulum vibrates more slowly than a shorter one, according to the square root of its length. These simple facts suggested the application of this curious instrument as the most correct measure of time, and an unvarying standard of linear measure; and in the hands of Newton it became the means of measuring the intensity of gravity at different parts of the earth's surface, and thence of determining its true figure, as Fontenelle observes, without quitting his elbow chair. The discovery of the Torricellean vacuum soon led to the application of the barometer as a means of obtaining the most accurate admeasurements of mountain elevations. The same object is attained by formulæ founded on the difference between the standard and the actual mean temperature, as indicated by deep wells and shaded springs, or the depth of any place below the boundary of perpetual congelation. A problem relative to a game of chance, proposed by a man of the world to an obscure Jansenist, gave birth to the doctrine of chances, or rather of probabilities, now a branch of mathematics applied to almost every subject of human investigation. Some of the most curious discoveries respecting the polarization of light resulted from an observation made by the celebrated French philosopher Malus, in 1810, while looking through a prism of calcareous spar at the light of the setting sun reflected from the windows of the palace of the Luxembourg. Hauy was led to his theory of the structure of chrystals by the accidental circumstance that, while looking over the cabinet of Mons. Defrance, a hexahedral prism of carbonate of lime separated from a group, which, having a corner broken off from the base by which it had been attached, led him to attempt to detach similar corners from the other angles, and enabled him,

after some time, to succeed in bringing into view its rhomboidal nucleus.

Such instances might be multiplied indefinitely; and surely they speak the language of encouragement and of hope to us, in whose locality are assembled so many curious processes of chemical and mechanic art, which continually offer new and curious facts for scientific scrutiny. The increased facilities for affording the benefits of a solid education are the sure and auspicious proofs of a correcter estimate of its value. The renovation of some of our educational institutions, and the rise of others, point to the certain perpetuation of every institution having for its object the diffusion of knowledge, and exhort us to our proper course of duty until our successors shall be prepared to take our place. In conclusion, let me quote the appropriate sentiments of the Roman orator, in his great work on the Republic. Our country, says he, has not given us birth and cherished us as if she expected no succour from us, or that, seeking to administer to our own convenience only, she might afford a safe retreat for the indulgence of our ease; *but that she might hold in pledge the variousand most exalted powers of our mind, for her own benefit; and that she might leave for our own private use such portions only as might be spared for that purpose.*

CRITICAL NOTICES OF NEW PUBLICATIONS.

The Education of the Feelings; 12mo, London and Edinburgh, 1838; pp. 200.

WHEN he undertook the composition of this Essay, its author appears to have been duly sensible of its difficulty; and, as the best means of surmounting this, he manifestly prepared himself for a proper accomplishment of his task, with an ample supply of reading and reflection on the principles of mental science and their applications. His little volume is introduced with the profession that its chief objects are, to urge the great importance of moral education, to show the bearing of a few great truths upon it, and to point out the natural laws which the Creator has established as the rule by which the Feelings are to be trained and cultivated.

Education of the Feelings is here restricted to imply their culti-

vation by exercising those of them which make us *wish* to do what we *ought* to do. Food is absolutely necessary to support life, and the Creator has implanted in us a strong desire to take sustenance when requisite; so, with regard to religion and morality, the Creator has not merely told us *what* we ought to do, but he has also given us feelings—such as love and reverence towards himself, the moral sense and benevolence—which make us *desire* to perform the duties enjoined by His laws. But we must know what the Feelings *are* before we can be prepared to undertake their proper management: wherefore, with a view to procure this indispensable knowledge, we should apply for instruction to the teachers of mental philosophy, whose province it is to show what are the mind's faculties and their functions, to explain the manner in which they act, and to point out their adaptation to external objects. This process has been adopted by the author whose plan for Educating the Feelings we are now considering; and, from the system of psychology most approved by him, he educes an exposition of the principles of human nature as the best calculated to advance the ends of education. His table of the mental constitution distinguishes each of the mind's faculties, with their uses and abuses, in a manner so explicit as to enable a judicious person, having experience in the management of children, and in the practical application of principles, to ascertain the power of each feeling possessed by each individual, and thus to obtain correct rules for the proper restraining of some feelings and the strengthening of others. Herein consists the philosophy of moral training, as exercised for self-discipline and for improvement of the young and uninstructed.

Having sketched a philosophy of the mental constitution, the author proceeds to exhibit an illustrative "*Example*;" and this, as we judge, is pregnant with the best feeling, and the soundest "philoprogenitive" wisdom. We transcribe his sentences, and pronounce them worthy of the gravest consideration:—"The views above adopted of the nature of man," he begins. at page 19, "have as yet been little acted upon in education; the time is come, however, when we may hope that they will be better understood, and that, by an improved system of education, the exercise of Religion and Benevolence will be daily more cultivated, until they shall become universal. That this is not at present the case is not surprising, when we consider that the selfish feelings are the first that come into action, that they act powerfully of themselves, and that they will not go on properly without the guiding and restraining influence of the intellect; whereas the intellect requires instructing before it is capable of taking charge of the propensities; so that upon our first entrance into life, the propensities not being guided by the unerring hand of the Creator, but depending upon reason for their right exercise, will, if not directed by some other intellect, run into excess and abuse, and some of them probably acquire a predominance to be retained through life. What, then, is the first essential in moral education? Assuredly, that the moral feelings and intellects of

those who undertake it should be well trained and devoted to their proper objects. Children are at first almost entirely the creatures of sympathy and association; they take the direction of their propensities and feelings from those with whom they are immediately connected; not what is said to them, but what is done before them, is of all-importance; for they can imitate an example before they can understand a precept. Can we, then, be too cautious as to whom we intrust the charge of expanding the young affections, of instilling into the new being those principles of piety and benevolence which are to constitute its future happiness? Surely not. Yet to whom, would we ask, is this task usually committed? Must we not say that, in ordinary cases, nursemaids, grossly ignorant, and with selfish feelings decidedly predominant, are chosen to this important office? That they are so unfitted is the fault of their education, or rather their want of it; yet how frequently do we find that a girl, unfit for any other occupation, is placed as the companion and guardian of a child, to train it up in the way it should go! If it be granted that our nursemaids are inefficient, do we find that mothers, even amongst the higher classes, are usually adequate to the office? If you look but to the education, the training, which young ladies commonly receive—to their course of life at that period of existence, when they ought to be qualifying themselves for the important trust which may hereafter devolve upon them—the question answers itself. What part of their studies or pursuits bears any direct relation to the sacred responsibility they so lightly take upon themselves? They come to the task ignorant of the anatomy, the physiology, the mental constitution, of the young being whose charge they undertake, and of all the most important provisions for insuring its health and happiness. Engaged in the frivolous pursuits of the world, introduced into society at an early age, dressing, dancing, visiting, when they are called to the most momentous duties they are obliged to rely upon an ignorant nurse, to trust to old women's tales for what ought to have been correct knowledge. The consequent mass of evil and suffering, of vice and misery, is beyond calculation. Deep and awful, then, is the accountability of those giddy and thoughtless beings who voluntarily immerse themselves in maternal duties, without first seriously and anxiously considering whether they be capable of discharging them. If the mother herself be in no respect fitted for a companion and example to her own child, serious must be the evil; another and common case is that, however, where the mother has a tolerable share of right feeling and good sense, but from want of knowing or sufficiently appreciating the importance of the trust committed to her, is disposed to charge others with the burden and trouble of it, who may be less capable than herself of fulfilling the duty. In many families the children seem to belong more to the nursemaid than to the mother; the nursery or kitchen is deemed the proper place for them, and a visit to the parlour is rather an exception to the rule. We say nothing of the folly of expecting a child to behave properly in the par-

lour, when it spends the greater part of the day in the kitchen or the nursery; what is of infinitely greater moment—can we expect a child to feel properly, when constantly surrounded by those whose own feelings are not sufficiently well directed to excite correct ones in its mind? And when the child is admitted to the society of its parents and their friends, how is its education managed? So long as it sits quietly and makes no noise, and looks like a little block of wood, it is called a good child, and perhaps overwhelmed with kisses —that is to say, it is commended for being inanimate and indolent, and for making no use of any one of its faculties. But as soon as it begins to grow restless, to pull about every thing within its reach, and to urge eagerly, and perhaps noisily, its oft-repeated question concerning this thing and that, the bell is rung, the child is considered a nuisance, and given to the servant, and while its little heart is bursting with shame and disappointment, which it can only express by cries and sobs, "naughty child" is reiterated, and it is again banished to the nursery. Thus is it punished for being happy, for employing its powers, for making its own best efforts for expanding its little mind; and precisely at the moment when all its faculties are in the best possible state for receiving right impressions, and for being directed to any thing and every thing that is good and useful, they are all checked, bad feelings are excited, and it is sent amongst those who may perchance misunderstand its wishes, and thwart, perhaps punish, its anxious desire to know and to improve; leaving the poor child with a deep and bitter sense of unjust treatment. That children must not talk and be troublesome in company, is an axiom; but it is one which very young children (and it is of such that we are speaking) cannot understand. If properly trained, they will in time learn to prefer the happiness and comfort of others to their own; but for this we must wait patiently, and take care, meanwhile, that we do not sacrifice their lasting good to our momentary convenience."

With this ample extract as an illustration of the author's preceptive rules for disciplining children, we consign his "Education of the Feelings" to the judgment of our readers, merely adding, for ourselves, that on every page of his Essay appear the beautiful features of candour and genuine philanthropy.

OUTLINES OF PERIODICAL LITERATURE,

RELATING TO THE NATURAL SCIENCES & PHILOSOPHY.

UNDER this department of the *Analyst*, we propose to specify the principal essays communicated through the journals of Periodical Literature, with the object of improving the natural sciences and philosophy; and, by our best endeavours in this way, to promote the enlightened views of cotemporary naturalists, and also to assist the studies of our friends by facilitating reference to their favourite investigations. We begin with the

Annals of Natural History; or Magazine of Zoology, Botany, and Geology; being a continuation of the *Magazine of Zoology and Botany*, and of Sir W. J. Hooker's *Botanical Companion;* conducted by Sir W. Jardine, Bart.—P. J. Selby, Esq.—Dr. Johnston—Sir W. J. Hooker—and Richard Taylor, F. L. S. 8vo, London, 1838, with graphic illustrations.

As its title indicates, this Periodical forms a continuation of the *Magazine of Zoology and Botany* and of the *Botanical Companion*, with an extended range for embracing the researches of geologists. The distinguished Editors, as an illustrious philosophical quinquevirate, profess themselves desirous of making the *Annals of Natural History* not merely a vehicle for original communications pertaining to this comprehensive subject, but as a means of enabling their readers to keep pace with the progress of scientific knowledge in every stage of its advancement. Four monthly numbers of the *Annals* are now submitted to the judgment of Naturalists; and, in designating the articles *seriatim*, we experience much pleasure in pronouncing our admiration of their excellence.

I. This first number opens with a paper on a new Oscillatoria, the colouring substance of Glaslough lake in Ireland, whereof the water is green as that of the sea, and contains innumerable minute flocculi which, on being examined under the microscope, are found to consist of exceedingly fine simple fibrils belonging to the Oscillatoria *ærugescens*, so named and described by Dr. Drummond its discoverer, from its assuming a bluish verdigris colour on drying. 2. Some remarks on the Germination of the Limnanthemum *lamnosum* illustrate Dr. Griesbach's peculiar views on this subject, with his reasons for proposing a new nomenclature of the Menyanthes and Villarsia, as generic appellations: a plate, with nineteen figures, explains the principles on which his opinions are founded. 3. The title of this is contributions to the natural history of Ireland, continued from the *Magazine of Zoology and Botany*, ii, 440: it treats of birds in the order *Insessores* whereof eleven are designated. These are Sylvia *rubecula* the redbreast; S. *tithys* the black redtail; S. *locustella* the grasshopper warbler; S. *phragmitis* the sedge warbler; S. *atricapilla* the blackcap warbler; S. *hortensis* the greater pettychaps; S. *cinerea* the whitethroat; S. *sibilatrix* the wood wren; S. *trochilus* the willow wren; S. *hippolais* the chiff chaff; and S. *regulus* the gold-crested wren. The author of the communication, Mr. Thompson, is not a mere biblical ornithologist; he describes his birds from observation of their habits, in a state

of natural freedom. 4. Mr. Gray gives an account, with denominations, of some new species of quadrupeds and shells procured from Sierra Leone; and two of the former are characterized. He represents the Antilope *sebra* as the most brilliant of all the kindred tribes; and his Felis *neglecta* is a highly interesting animal, in size like a small leopard. Fourteen different kinds of shells are distinguished and named, by this ingenious naturalist: these are, Aporrhais *senegalensis*, Fusus *elegans*, F. *niveus*, Nassa *vitrea*, Cardium *læve*, Turbinella *spinosa*, Drillia *umbilicata*, D. *clathrata*, D. *bicolor*, D. *suturalis*, Demoulia *pulchra*, Buccinum *retusum*, Pleurostoma *tenuis*, and Mactra *sauliana* so "named in honour of Miss Saul of Poplar a most industrious and liberal collector of shells." The *drillia* and *demoulia* are new genera: the latter is intermediate between the *nassa* and *dolium*, and their diagnostic features are here described. 5. This is a translation from the first volume of the *Mémoires de la Société des Sciences Naturelles de Neufchâtel*, and it forms the prodromus of a monograph of the Echinodermata by Dr. Louis Agassiz whose paper manifests his profound acquaintance with the subjects of his investigation. 6. Observations on the Scottish Mollusca Nudibranchia by Dr. G. Johnston are illustrated with a plate representing sixteen figures. He divides the tribe into two families, the Doridæ and Tritonidæ, and then describes eight kinds of the former—the Doris *tuberculata*, D. *obvelata*, D. *bilamellata*, D. *lævis*, D. *pilosa*, D. *nodosa*, D. *nigricans*, and D. *barvicensis*, with references to their economy. 7. This consists of Letters from Mr. Cuming at Manilla, Dr. Schomburgh at New Amsterdam and Demerara, and Mr. Gardner at the Organ-Mountains in Brazil, with sketches of the observations and discoveries of these adventurous naturalists.

II. Article eighth of the *Annals* is Mr. Berkley's anglo-hellenic exercise on the fructification of the Pileate and Clavate tribes of the Hymenomycetous Fungi, and this is illustrated by a plate with fifty-seven figures. He traces a history of the state of knowledge, in 1838, respecting the hymenium in the *Agaricine* family; and he adduces many facts to confirm his theory—that a quaternary arrangement prevails in the cryptogamous plants. 9. Mr. Gunn's notices accompanying a collection of quadrupeds and fish from Van Diemen's Land, are followed by Mr. Gray's descriptions of new species. Among the Mammalia, he specifies the Thalacinus *cynocephalus*, Phalangista *cookii*, P. *vulpina*, P. *fuliginosa*, Perameles *gunnii*, Phascolomys or *wombat*, Dasyurus or *devil*, D. *viverrinus*, Hydromys *chrysogaster*, the Echidna which is harmless and makes good food, and the Kangaroo of four kinds—the boomer or forrester, the brush, the wallabee, and the rat kangaroos. His Fish, are the nurse, leather-jackets, parrot-fish and the sea-horse. 10. Mr. Reade argues, that spiral vessels do exist in the roots of dicotyledonous plants, and his facts in support of this induction appear to be conclusive. 11. His description of the Scottish Mollusca is continued by Dr. Johnston; and his subjects are, Tritonia *hombergii*, T. *arborescens*, T. *plebeia*, Melibea *pinnatifida*, M. *coronata*, Eolidia *papillosa*, E. *cuvierii*, E. *rufibranchialis*, E. *purpurascens*, E. *plumosa*, E. *despecta*, Triopa *claviger*, and the T. *nothus* a beautiful animal, and remarkable for the darkness and disposition of its colours. Mr. Gray was the first to discriminate this genus; and he has named it in allusion to *Triops* one of Neptune's sons: a plate, with eleven figures, contains his graphical illustrations. 12. Some original remarks on the Genus Torreya are advanced

by Dr. Arnott, who also propounds a new systematic description of the male and female trees: the name honours Dr. Torrey of New York, a liberal and enlightened botanist. 13. Observations on the Procyon or Raccoon with the distinctions of two new species, from the pen of Prof. Wiegmann, occupy this article: to avoid mistakes, the five species of Raccoon are described—the Procyon *lotor*, P. *hernandesii*, P. *brachyurus*, P. *obscurus* and P. *cancrivorus*. The professor announces his desire to obtain an accurate account of the country of the different species, with a view to fixing their geographical range. 14. Two new genera of Californian vegetables are designated by Mr. Nuttall; they are, the Anemia *californica* and the Diplacus whereof the species *punicea*, *glutinosa*, *latifolia*, and *longiflora* are noted. 15. Mr. Tweedie's journal of an Excursion from Buenos Ayres to the Serras de Tandil, includes information not undeserving the attention of farmers and phytologists.

III. His observations on the Coregoni of Loch-Lomond, with a plate and two figures, afford Dr. Parnell an opportunity of describing two species which he proposes to designate the Coregonus *lacepedii* the long-nosed powan, and the C. *microcephalus* the short-headed powan: the corregoni are also called fresh-water herrings, and yield a wholesome and delicate food. 17. Mr. Gardner gives an account of his journey to, and residence in, the Organ Mountains, with remarks on their vegetation: he notices the plants peculiar to the marshes, pastures, cultivated lands, bushy-places and virgin-forests. 18. The Irish *Insessores* are continued by Mr. Thompson: his subjects are the Moticilla *alba* the pied wagtail, M. *boarula* the gray wagtail, M. *flava* the yellow wagtail, Anthus *pratensis* the meadow pipit, A. *aquaticus* the rock pipit, Saxicola *œnanthe* the wheat-ear, S. *rubetra* the whinchat, S. *rubicola* the stonechat, Parus *major* the great titmouse, P. *cæruleus* the blue titmouse, P. *palustris* the marsh titmouse, P. *ater* the cole titmouse, P. *caudatus* the long-tailed titmouse, P. *biarmicus* the bearded titmouse, and Bombycina *garrula* the bohemian wax-wing. 19. A new English species of Urtica is described by Mr. C. C. Babington: he denominates it the U. *dodartii*, adding its specific characters and those also of the D. *pilulifera*, according to the Linnæan rules. 20. Mr. Berkeley resumes his notices of the British Fungi, from the *Magazine of Zoology and Botany*, and his subjects are these—*Agaricus* fulvus, decolorans, grammopodius, unguinosus, calyptræformis, pudens, erythropus, vaillantii, conchatus, cyanus, bolanis, reticulatus, trechisporus, centunculus and depluens, *Cantharellus* lutescens, undulatus and fissilis, *Merulius* tremellosus, *Polyporus* spumeus, *Boletus* fellens, *Thelephora* lævis and lactea, *Clavaria* fritillaris and flavipes, *Typhula* gracilis, *Pistillaria* culmigena, *Helvella* elastica, *Peziza* melaloma and rhabarbarina, *Dacrymyces* urticæ, *Sclerotium* neglectum, *Sphæria* ophrioglossoides, pedunculata, hippotrichioides, riccoidea, populina, sinopica, acervata, pardalota, obducens, avellanæ, ostruthii, dianthi and vagans, *Cystipora* orbicularis and *Labrella* ptarmicæ. A plate, with thirty figures, illustrates these notices most of which are derived from actual observation. 21. Mr. White characterizes a new species of Epilobium nearly allied to E. *angustissimum* and E. *rosmarinifolium*, and he denominates it the E. *canescens* so as to give a suitable idea of its habit: his comparative description of the three species is intended to determine their mutual affinities and diagnostic distinctions. 22. In the *Companion to the*

Botanical Magazine, Mr. Allan Cunningham began a specimen of the botany of New Zealand: he proceeds with his list, giving the Piper *excelsum*, Peperomia *urvilleana*, Damara *australis*, Phyllocladus *trichomanoides* and *rhomboidalis*, Podocarpus *ferruginea* and *totarra*, Dacrydium *mai*, D. *plumosum*, D. *excelsum*, D. *cupressinum*, Urtica *feror*, U. *debilis*, Elalostema *rugosa*, Hedicaria *dentata*, H. *macrophylla*, H. *angustifolia*, H. *scabra* and Brousonetia *papyrifera*. When completed, Mr. C's specimen will constitute a valuable addition to phytological history. 23. Mr. Ogilby remarks on some parts of 4 and 9 of the *Annals*, and then describes two new kangaroos from Van Dieman's Land: he distinguishes them as the Macropus *fructicus* and M. *rufiventer* which is the native wallabee. 24. Mr. Kotschy is exploring different countries of Western Africa, as botanist to an expedition of Austrian geologists, and has been very successful in his researches for new and rare vegetables.

IV. Mr. Thompson describes zoologically the *Surnea nyctea*, or Snowy Owl, from a specimen shot in the north of Ireland and from three live birds, on whose economy and habits he makes new and interesting observations. 26. A fifth article on the natural history of the British Entomostraca, by Mr. Bird, in continuation from the *Magazine of Zoology and Botany*, is illustrated by a plate exhibiting fifteen well delineated figures. This paper is devoted to the anatomy of the Daphnia *pulex*, D. *vetula*, D. *reticulata* and D. *cornuta*, with their habitates and synonymes. 27. Mr. Berkeley renews his notices of British Fungi, and describes the *Lepostroma* juncinum, *Diderma* contextum, *Didymium* melanopus, *D.* xanthopus, *Diachea* elegans, *Stemonitis* typhoides, *S.* arcyroides, *Arcyria* ochroleuca, *Ascosricha* chartarum with a full and valuable "notice," *Isaria* arachnophila, *I.* intricata, *Anthina* flammea, *Syzygites* megalocarpus, *Myxotricum* chartarum, *M.* deflexum, *Helminthosporium* clavariarum, *Dematium* echinobotryum, *Macrosporium* sarcinula, *Aspergillus* alternatus, *Botrytis* citrina, *B.* curta, *Penicillum* fasciculatum, *Oidium* chartarum, *Epochnium* macrosporoideum, *Sepedonium* roseum, *Xenodochus* carbonarius, *Torula* graminis, *Cylindrosporium* ficariæ, *Uredo* artemesiæ and *U.* pompholygodes: in this article are several very interesting remarks and a plate exhibiting six illustrations. 28. Mr. Schomburgh's phytography of the Triplaris *americana* or ant-tree is more comprehensive than that of his predecessors, and it includes an account of the "light brownish" insect which inhabits the hollows of the trees distinguished by its name. 29. From the "*Recherches Anatomiques et Physiologiques sur Garance*," by M. Decaisne, there is an extract in which the author communicates much highly-important information on the *root* of the Madder: the English version is particularly well executed, and thus adds value to the very valuable original. 30. Mr. J. E. Gray begins a catalogue of the *Slender-tongued* Saurians, with descriptions of many new genera and species: he proposes a new arrangement,—a *typical* group, comprising the saurians and ophidians, and *annectant* groups, including the amphisbenians, chelonians and emydosaurians: this catalogue will carry a reform-bill, uncontaminated with hypocrisy, selfishness, and injustice, into the saurian corporations; it deserves the best attention of naturalists. 31. In a letter to Professor Lindley, the characters of nine new species of Glumaceæ are delineated by Dr. C. J. Ners von Esenbeck, who assigns to them as appellations—the Melica *colpodioides*, Lophochlæna *californica*, Polyantheriae *hystrix*, Poa *donglasii*, Chasmantium *ornithorinchum*,

Ceratochloa *simplex*, Eragrostis *cretacea*, Meoschium *griffithii* and Isolepis *hispidula*. There would be less appearance of a deviation from the rules of ordinal nomenclature of botany, if the *Glumaceæ* or chaff-bearing vegetables were designated from the name of a typical plant. 32. Mr. Eyton proceeds with his attempt to ascertain the Fauna of Shropshire and North Wales; his contributions to this local ornithography commenced in the *Magazine of Zoolgy and Botany*: he comes now to Aves, and of these he specifies one hundred and seven subjects. 33. Mr. J. E. Gray explains his views concerning the Phalangista *cookii* in an additional communication. 34. The prodomus of a monograph of the Rodiata and Echinadermata is continued by Dr. Louis Agassiz; and, in this article, forty species are characterized. 34. The descriptions of British Chalcidites, by Mr. Walker, relate to the Insecta Tetraptera- *stirps* ichneumonina, *order* chalcidites and *genus* cirrospilus: whereof five species with thirty-six varieties, are enumerated—Cirr. *vittatus*, C. *thasus*, C. *elegintissimus*, C. *salatis* and C. *diallus*; and these are succeeded by Mr. J. E. Gray's new species, with a figure, of Tetrapturus, which he names the *herschelli* in honour of Sir John Herschel its discoverer. At a meeting of the Zoological Society in October of last year, Col. Sykes read a paper on the identity of the Wild Ass of Cutch and the Indus with the Dreggetai or Equus *hemionus* of Pallas, a proposition which the colonel supports with many facts and ingenious arguments, founded on actual observation. Mr. Curtis described five new genera of Coleoptera, at a meeting of the Linnæan Society, May 1st, and these are the cascellius, cardiophthalmus, odontoscellis, cyllocellis and metius, all belonging to the Carabidæan family. On the same occasion, Mr. Bentham clearly shewed that the *Arachis* should be placed among the Hedysareæ, and also adduced good reasons for referring the *Voandzeia* to the Phaseolæ: of the former, he distinguished five species—the Arachis *hypogæa*, A. *glabrata*, A. *pusilla*, A. *prostrata*, A. *villosa*, and A. *tuberosa*, by their diagnostic characters. Dr. Traill's remarks on the ossiferous caves of Cefn in Denbighshire, were read at a meeting of the Royal Society of Edinburgh, and the professor illustrated his paper with a view of the cliffs of Cefn, and with a plan and sections of the principal cave. Among the proceedings of the Royal Academy of Berlin, appear some ingenious and geological and zoological observations by M. Von Buch on the Jura of Germany: he considers the "jurassic" chains to have been originally produced in their present form, with their canal-like valleys which traverse four or five times the whole breadth of the chain, and with their deep inlets or sections. With five miscellanies on the Fungi of India, the Trachypterus *vogmanus*, the Otis *tarda*, the zoology of Java, and the two species of Echidna; and with three meterological observations and a table, we arrive at the end of June for the first year of the *Annals* which, after a careful inspection, we appreciate highly, and recommend earnestly to the consideration of all practical naturalists.

The London and Edinburgh Philosophical Magazine, and Journal of Science; being a continuation of the Annals of Philosophy; conducted by Sir

David Brewster, F.R.S. Richard Taylor, F.L.S. and Richard Phillips, F.R.S. 8vo, London, 1838.

The current year begins with No. 71, vol. xii of the Third Series of this Periodical which, from the excellence of its management and its merits, has long been regarded as a work possessing much influence and authority. Our intention is to make the *Analyst* a source of reference to the most important of its valuable contributions to philosophy and the sciences.

JANUARY.—Researches on the Maximum Density of Liquids, extracted from two Memoirs of M. Despretz are given in a translation, and his experiments with the results prove—that sea-water, and all aqueous solutions, acid, alcoholic, saline and alkaline, have a maximum of density; and that this maximum sinks much quicker than the freezing point, the variation of which, as well as that of the density, is nearly in proportion to the quantity of matter added to the water. In an investigation, through a series of elaborate formulæ, Mr. Torey endeavours to show mechanically the cause of elliptical polarization; and, next in order, come Mr. Kennedy's observations upon the Œconomy of several species of Hymenopterous insects. These are Cratomus *megacephalus*, Spyga 4-*guttata*, Trypoxylon *figulus*, T. *clavicerum*, Crabro *spinipectus*, Stigmus *troglodytes*, Diodontus *insignis*, D. *gracilis*, D. *corniger*, Pemphredon *lugubris*, P. *morio*, P. *unicolor*, Psen *atratum*, Odynerus *quadratus*, O. *bidens*, Hylæus *signatus*, Chelostoma *florisomnis*, Osmia *bicornis*, O. *spinolosa*, and Heriades *campanularum*. Some new facts are recorded here by Mr. K. who appears to be a well-informed and indefatigable observer. We bespeak attention to Mr. Bird's observations on induced Electric currents, with his description of a magnetic contact-breaker which, we hope with him, will be found eventually of service to the chemist for electrolytic purposes, and for conveniently applying voltaic electricity in the treatment of diseases. Article V. is a contribution from Sir D. Brewster, on a singular development of Polarizing Structure in the Crystalline Lens after death, and on the cause, the prevention, and the cure of cataract: may the proposed method prove eminently successful. In addition to the two already known combinations of iodine and mercury—the yellow iodide and the scarlet biniodide—Mr. Hunt gives an account of a third, the tritiodide of mercury, with a process for its evolution. Mr. Walgon propounds a new mode of exhibiting the colours of thin plates, and Mr. Simon has discovered a new vegetable base in the root of the white hellebore, along with veratria: he calls it Jervine, and applies to it some very peculiar properties. A method of analysing Organic Compounds is submitted by Mr. Rigg, with reference more particularly to agriculture, to horticulture, and to some of those manufactures wherein vegetable products are employed. Dr. Falconer's and Captain Cautley's joint account of a Fossil Monkey from the Sewálik Hills is illustrated by two plates with nine figures: this, and the notice of Fragments of the Sivatherium, make an important contribution to fossil zoography. The record of meteorological observations at Bermuda by Col. Emmett, with his notice of an Aurora Borealis in low latitudes, is followed by Mr. Lubbock's communication on the wave-surface in the theory of double refraction, and by Mr. Noad's experimental remarks on the peculiar voltaic conditions of iron and bismuth. We are furnished with a most interesting

article on the structure and growth of the more perfect plants, extracted from Professor Meyen's Report of the progress of Vegetable Physiology for the year 1836, originally published in Wiegmann's journal. "*January*," concludes with Mr. Sylvester's analytical development of Fresnel's optical theory of crystals, and with a supplementary number, including Mr. Walter's notice on the bichromate of the perchloride of Chrome, Professor Forbes' observations on Meteors, reports of learned Societies, and a dozen of brief but valuable miscellanies.

FEBRUARY.—This chilly month is introduced with a paper on a new property of Nitre by Mr. Talbot: he regards this property as having an immediate bearing upon the fundamental doctrines both of double refraction and of crystalline structure, and thinks they require some modifications. Col. Hall's meteorological observations made during a residence of ten years in Colombia, include an exhibition of facts greatly conducive to the philosophy of climate, and their usefulness is extended by his general table of temperatures and elevations. On the results of long and patient investigation, Dr. Dalton founds an essay on the constitution of the atmosphere, with an account of the sulphurets of lime; and, next in order, we have Mr. Lubbock's article on the divergence of the numerical coëfficients of certain inequalities of longitude in the lunar theory. Dr. Schleiden's observations on the development of the organization in phænogamous plants, in an English version, with a plate exhibiting thirty illustrative figures, is a paper both curious and instructive. It is followed by Mr Watkins' modifications in electro-magnetic motive machines; a plate represents his apparatus, which has the appearances of aptitude and ingenuity. Mr. Matteucci presented to the French Academy an account of his physical, chemical, and physiological researches relative to the torpedo, with some remarks on the contractions of the frog produced by the contact of the muscles with the nerves; it appears here in Mr. Francis' translation. Under the heads Proceedings and Miscellanies, are several chemical, magnetical, electrical, and meteorological sketches; and with these the "*February*" is respectably finished.

MARCH has an experimental introduction in a letter addressed by Professor Schœnbein to Dr. Faraday, on the mutual voltaic relations of certain peroxides, platina, and inactive iron. Three analytical articles stand in succession: these are, Mr. Bird's notes on indirect chemical analysis: Mr. Rigg's further observations on the ultimate analysis of organic compounds: and Mr. Brett's analysis of six double salts of mercury—the *chloro-cyanides* of ammonium, of sodium, of calcium, of magnesium, of barium, and of strontium, and mercury. Dr. Schleiden concludes admirable observations on the organizations of phænogamous plants; and Mr. Prideaux describes the *Kauri* or Cowdee Resin, with his experiments in relation to its employment in the arts: and next in course are Mr. Lubbock's formulæ on the variation of the arbitrary constants in mechanical problems. Four short communications succeed—a chemical analysis of the substance of the electrical apparatus of the torpedo, by Mr. Matteucci: Mr. Talbot on a new property of the iodide of silver: Mr. Tovey's remarks on Prof. Sylvester's development of Fresnell's optical theory of crystals: and Prof. Johnston on the composition of certain mineral substances of organic origin; and first, of middletenite. There is then an interesting passage selected from Macfadyen's Flora of Jamaica, relating to the cultivation and uses of the indigo plant; and lastly,

under the sections intituled Proceedings of Learned Societies, and Miscellanies, the list of biographical, astronomical, geological, chemical, and physiological, presents high claims to attention.

April comes in with Dr. Andrews' account of his experiments on the action of nitric acid upon bismuth and other metals; and, for the second article, we have further experiments of Prof. Schœnbein on the current excited by chemical tendencies, independent of ordinary chemical action. Four chemical communications follow—Mr. Powell's notes on repulsion by heat: Mr. Giraud's observations on the nature and properties of teredide of chromium; Prof. De Morgan on the relation between the number of faces, edges and corners in a solid polyhedron: and Prof. Johnston on the received equivalents of potash, soda, and silver. B. D. then offers a curious exposition of the path of the projectile weapon of the natives of Australia, called the *boomarang*, or kylee, at present a very general source of exercise and amusement. Six papers, mathematical and chemical, occupy as many places in succession: thus, Mr. Smith's method of finding the equation to Fresnell's wave-surface: Mr. Taylor's description of two calculi composed of cystic oxide: Prof. Johnston's description and analysis of hatchetine: Messrs. Pelouse and Richardson's researches upon the products of the decomposition of cyanogen in water: notes of Prof. Sylvester's to his analytical development of the optical theory of crystals: and Mr. Jerrard's interpretation of the occurrence of the form θ in passing from general to particular values of certain algebraic functions. Among the Proceedings of Learned Societies, and with justly-merited distinction—are, a view of M. Becquerel's electrical researches, a view of Mr. Whewell's researches on the tides, a paper by Sir D. Brewster on the colours of mixed plates, another by Mr. Ivory on the attractions of homogeneous ellipsoids, the eleventh series of Dr. Faraday's researches in electricity, Mr. Wharton's explanation of the phænomena of intermitting springs, Prof. Daniell's letter on voltaic combinations with reference to the mutual relations of generating and conducting surfaces, Prof. Powell's researches towards establishing a theory of the dispersion of light, and Sir W. R. Hamilton's address at the Royal Irish Academy—an address remarkably distinguished by pure learning, sound judgment, and exquisite taste. Mr. Scoresby's improvements in magnetical apparatus, and Messrs. Dumas and Liebig's analyses of the citric, tartaric, and organic acids, have a place as miscellaneous articles.

May gives us several chemical articles to begin with—remarks on a singular case of the equilibrium of incompressible fluids, by Mr. Pratt: Prof. Johnston on the dimorphism of the chromate of lead, and on the composition of ozocerite: sequel to an essay on the composition of the atmosphere, by Dr. Dalton, who concludes that the proportion of oxygen to azote in the atmosphere on the surface of the earth is not precisely the same at all places and times; and that, in elevated regions, the proportion of oxygen to azote is somewhat less than at the surface of the earth. Mr. Brooke's note on the apparent cause of isomorphous substitution: and Mr. Phillips' observations on isomorphism in reference to Mr. Brooke's communication. Mr. Brooke's observations on urinary calculi, with a descriptive account of the collection in the museum of St. Bartholomew's Hospital, make important addition to pathological chemistry: they include a table exhibiting the relative frequency of each species together with the order of succession of the layers in

the alternating calculi. Phenomena, both new and curious, are unfolded in Messrs. Coopers' paper on the luminosity of the human subject after death, with remarks and details of experiments made with a view to determine the nature of the fact. As proceedings of the Royal Society, are the twelfth and thirteenth series of Dr. Faraday's experimental researches in electricity: Mr. Bowring's proposal for a new method of determining the longitude, by an absolute altitude of the moon: Mr. Reade's inquiry into a new theory of earthy bases of vegetable tissues: Mr. Bunt's description of a new tide-guage: and Captain Newbold's account of the *Régar*, or black cotton soil of India, which he believes to be a sedimentary deposit from waters in a state of repose. At the Geological Society, Mr. Whewell delivered the anniversary address: one portion only of this is here published, and it records the characters of deceased members. Mr. Westwood's description of several new species of insects belonging to the family of the sacred beetles, appears as a proceeding of the Zoological Society: Mr. Waterhouse's characters of a new subgenus of *mus*, and of the *reithrodron* and *abracoma* two new genera of rodents: Mr. Sells' observations on the *vultur aura*, with Mr. Owen's notes of dissections of the heads of two specimens: and Prof. Airy's paper on the intensity of light in the neighbourhood of a caustic, bring us to the miscellanies. These comprise an outline of Prof. Pullen's astronomical lectures at Gresham College; Mr. Dutrochet's experiments shewing the influence of temperature, light, and mechanical irritation and chemical agency, on the circulation of the *charaflexis*; M. Dujardin's description of a new double salt formed of two acids united to one base, and called by him the oxalo-nitrate of lead; M. D'Arcet on the action of iron at a high temperature on camphor, and on benzoic acid, producing benzin; M. Ehrenberg on the adulteration of carmine; M. Rose on tungstate of chloride of tungsten, which he regards as a remarkable compound, because tungstic acid, which is one of the most fixed substances, is rendered volatile.

JUNE.—Mr. Rose read an essay on the formation of calc-spar and arragonite, before the physico-mathematical class of the Academy of Sciences at Berlin, and we have it here in Mr. Francis' translation: this article records the deductions from a course of practical researches, and constitutes an important addition to the stores of experimental chemistry. Of the same character, are the observations on sulphureous æther and sulphate of ætherine, by Dr. Hare; and Prof. Johnston's communication on the supposed analogy in atomic constitution between the earthy carbonates and alkaline nitrates. Mr. Potter adds to his former detail of results from his photometrical experiments, and concludes that they press upon our attention, with full force, the inadequacy of the undulatory theory of light. The first part of Mr. Laming's essay on the primary electrical forces, is experimental and inductive: he endeavours to "test the new theory" by reference to experiments already known and to facts generally acknowledged. Mr. Hogg submits a specimen of a thermometrical diary; and Mr. Wright makes observations on Dr. Buckland's theory of the action of the siphuncle in the Pearly *nautilus*, with an illustrative figure; and then we arrive at the proceedings of learned societies. Mr. Whewell's anniversary address to the Geological Society is concluded; and, among the transactions of the Royal Astronomical Society, are Sir J. F. Herschel's and Professor Henderson's account of a remarkable increase of magnitude of the star η in the constella-

tion *Argo*; the value of the mass of Uranus, deduced from observations of its satellites, by Dr. Lamont of Munich; and other short notices. We have notes of observations at the Zoological Society, by Mr. Bennett on the tentacula of Physalia *pelagica*; by Mr. Gray on the cephalopod inhabiting the argonaut; by Mr. Bell on the genus Galictis which, with the two species G. *vittata* and G. *allamandi*, he characterizes; and by Mr. Ogilby on the Hylobates *choromandus* a new species of Gibbon. Before the Linnæan Society several papers have been read—Mr. C. C. Babington's on the structure of the Cuscuta *europæa* the greater dodder; Mr. Griffiths on the Mosses of Upper Assam, including many not hitherto described; Mr. Scomburgh's on the Mora *excelsa*, a lofty and singular tree, native in the forests of British Guiana, affording timber of excellent quality, being close-grained, strong, tough, and durable, and not liable to split; and Mr. Valentine's on the existence of Stomata in Mosses where these organs were generally supposed to be absent until Mr. V. discovered them in the Bryum *crudum* and the Fumaria *hygrometrica*, in which last they consist of a single cell in the form of a hollow ring. The Theory of Volcanoes, constituted the subject of a paper read at the Royal Institution, by Mr. Brayley, whose object was to explain the theory of volcanic action dependent on that of the secular variation of the isothermal surfaces within the globe, and to offer reasons why the chemical theory of volcanoes originally proposed by Sir Humphrey Davy should not be discarded as a mere chemical dream. Mr. Blake's experiments relating to the electrical currents produced during the processes of fermentation and vegetation; Mr. Watkin's letter on the decomposition of water by thermo-electricity; and Messrs. Dease and Simpson's discovery of the north-west, come under the head of intelligence and miscellanies, which are followed by meteorological observations and a table closing the "June" of this very instructive and philosophical journal.

The Phrenological Journal and Magazine of Moral Science; 8vo, London and Edinburgh, 1838.

This Journal first appeared on the field of literature in 1823; and, "from the first moment of their undertaking, the proprietors have been actuated solely by the desire to cultivate and extend the knowledge of what they considered to be a science fraught with the most beneficial consequences to the human race; and they have endeavoured to accomplish this end in that spirit of purity and peace which their philosophy so strongly inculcates on those who embrace its truths." Fifty-three quarterly numbers, forming ten thick volumes, having been completed, the conductors open a new series of their periodical with No. LIV, and renew their engagements to prosecute the original objects of the journal in the same generous spirit and with unabating zeal.

Embracing the comprehensive range of psychological investigation, this magazine exhibits the materials of its composition under this distinct order of arrangement:—1, *Miscellaneous Essays*, devoted especially to the elucidation and improvement of Mental Science and its practical applications. 2, *Cases* and *Facts*, having relation to the structure and functions of the brain

and nervous system, whether in a state of health or disease, with disquisitions on ethical questions even when discussed without reference to organization. 3, *Notices* of *Books*, comprising an account, analytical or critical, of such works as tend to promote the study of mind and its manifestations. 4, *Short Communications* designed to form an assemblage of such hints, suggestions, observations, criticisms, and prospective and retrospective notes as occur to the minds of correspondents. 5, *Notes* on *Opinions*, *Intelligence*, and *Biographical Sketches* intended to convey information with respect to the proceedings of societies, to lectures and discussions, and to the memorials of distinguished psychologists. As an inducement to those who may feel disposed to ascertain, from personal examination, how well these pretensions have been realized, we proceed to select the outlines of the current eleventh volume: our own conviction is, that the Editors have amply and honourably redeemed their pledge; and, with this satisfactory impression, we enter on a survey of their

No. LIV.—An address by the original proprietors and conductors of the Journal, and a prefatory explanation respecting the plans and prospects of the new Editor, introduce the volume. Dr. Combe evinces, with equal suavity and force of demonstration, the fallacy of Professor Tiedemann's comparison of the Negro brain and intellect with those of the European: the doctor establishes this position also, as the strangest thing of all—that Tiedemann's conclusions or arithmetical results are directly at variance with the evidence of his own facts and figures, and strongly confirmatory of the opinion which it his sole purpose to refute. Mr. Combe's letters on the institutions of Germany, afford much valuable statistical information regarding the state of mental philosophy, in some of the continental cities. There are great good sense and much harmony in the Remarks on the function of the faculty and its organ, through whose instrumentality the mind perceives melody: the writer's object is, to assist observers in their labour, by giving a more precise description of *Sound* as it occurs in music. An improvement of organological busts is suggested by Mr. Hytch; his reasoning is replete with sentiment, and he may be thought persuasive. C. B. states the case of his own head, in which the organs of Concentrativeness are small, while those of Inhabitiveness are supposed to be large: this case displays ingeniousness and sincerity for its characters. The facts of a peculiar revival of memory, of a spectral illusion, and of a monomania apparently induced by great and unusual excitement of the faculty of Tune through its organ, merit unprejudiced attention. The short communications, notes on opinions and intelligence will furnish topics of profitable mental exercise and self-discipline in counteracting the poison of prejudice, to well-regulated minds.

LV.—Suggestions on the requisites for the advancement of mental science are very judicious: they conclude with the remark, applicable to all the sciences—that, simplicity and precision, not fine writing, should be esteemed a first excellence in the literature of science, and especially so in the record of its facts. An experiment proposed for preventing the atrocities committed in New South Wales by transported convicts, deserves the serious consideration of those who take an interest in the diffusion of human happiness. Mr. Combe remarks on the organological busts, and regrets that, by the manner in which Mr. Hytch treated this subject, he should furnish the opponents of phrenology with a plausible pretence for affirming that the very elements of

accuracy are disregarded in this of observation. In a letter on Antipathies, Sir G. Mackenzie proposes a subject which, as the editor says, "is abundantly worthy of minute attention, but will require exact observations, and a very careful analysis of the cases observed, before useful results can be expected." Mr. Simpson visited Mr. Heldenmair's school at Worksop, and he describes its economy with approbation. From his facts to show the connexion of disease with war, Dr. Barlow derives the conclusion—that war not only gives rise to disease; but, wherever a tendency to disease exists, war increases its force and augments its fatality. Four miscellaneous articles are occupied with the discussion of matters relating to the new science of mind: six papers containing cases and facts; notes on opinions; short communications; and intelligence, bring us to the end of the number, which is distinguished by extensive and varied erudition, and especially by a fine tone of moral feeling.

LVI. comprises nine "Miscellaneous Papers," beginning with an exposition of Dr. Elliotson's characters of the original phrenological discoverers: this is distinguished by exemplary candour and its irresistible effects: the doctor is a gallic idolater and combats with the recklessness of a cyclopic gladiator, in exaltation of the image he would compel the world to worship. Observations on the new system of colonization, with reference to South Australia and New Zealand in illustration, have for their chief purpose to show, that political economists ought constantly to keep in view the influence of different mental characteristics in producing results from fixed extrinsic circumstances, and that the planters of colonies should pay due attention to this important element in their calculations of the means for ensuring success. The recent attacks on the new science of mind are considered with great good humour, and they are proved to be a mere array of false or fallacious or foolish imaginings by the strength of the strongest demonstration. In this article, a liberal magazine is convicted of "a spirit too sordid and grovelling for the appreciation of the higher moral bearings of phrenology." Mr. Simpson's letter on sound and tune, is not inharmonious: his reasonings on force and resistance, are weighty and sensible. The sixth and seventh papers happily expose two "deliberate attempts to impede the progress of knowledge and truth," on the part of those comfortable little philosophers who jocosely designate themselves "the great in science." Mr. Hytch offers some ingenious suggestions on the unascertained Organ above that of Ideality," and he seems to regard it as the instrument of a Faculty which enables us to experience a "*love of the past*:" it is followed by a succinct account of the causes which occasioned the resignation of Sir W. C. Ellis as superintendent of the Middlesex county lunatic asylum. Among the seven "Causes and Facts," the first is one of congenital idiocy, and the subject of it, a boy, is represented as "a living fact supporting the truth of the great physiological principle—that the brain of a human head measuring only fourteen inches in horizontal circumference is inadequate to perform its function of manifesting mind sufficient for the necessary business of society, or even for the individual's own preservation." The rest are entituled, a curious affection of language; an instance of temporary derangement induced by a sudden shock to excited benevolence; a sudden affection of the philoprogenitive feeling; a notice on the cerebral development of a professor lately deceased; an apparently singular phenomenon in apoplexy; and a

case where loss of the perception of colours intervened upon a defect of vision in one eye, and was concomitant with deficiency in the organ of colouring particularly on the same side. These papers are well calculated to gain the attention of students, inquisitive for entertaining or scientific knowledge. Through seven "notices of books" and a chapter of remarks on eight periodicals, we are brought to a "note" on M. Dubois' new philosophical deductions applied to the study of idiotism and insanity; and this note concludes with the sentiment—that M. Dubois' classification of idiots is too vague, and his employment of the terms *instinctive*, *intellectual*, and *reasoning*, appears to be altogether arbitrary, for the purpose of giving the semblance of exact classification without the reality. The "short communications" are—on an empirical anticipation of phrenology, classical studies, lesions of the brain, dreaming, the heads of Jeremy Bentham and Confucius, and on the innate dispositions to attack and to resist. From the "intelligence" we learn—that in all corners of the land, there are societies, institutions, and lecturers actually engaged in cultivating the new mental science, and in encouraging its beneficent applications. We are persuaded that the peaceful and highly moral Miscellany here delineated, would furnish the general reader with a larger share of rational amusement and of instruction adapted to promote the spread of human happiness, than most of those periodicals which evince an inclination to seize the advantages of popularity through the mere noise of extravagant pretensions.

The Edinburgh Medical and Surgical Journal, exhibiting a concise view of the latest and most important discoveries in Medicine, Surgery, and Pharmacy: 8vo, Edinburgh and London, 1838.

No. CXXXV., for April, 1838, or the fifty-eighth number of a new series, embraces some articles on subjects in chemistry and phytology. The first is an account of the liquidization and solidification of carbonic acid gas, an interesting experiment successfully performed by Dr. Hope, in the chemical class-room of the University of Edinburgh, and witnessed by many distinguished scholars, philosophers, and naturalists. 2. This is a sketch of observations on the grains of Teel, or Till, or Ramtill, the Nook in Abyssinia, the Verinnua or Kertrello in Hindostan, and the edible oil obtained from it, accompanied with a list of the botanical names by which the plant has been designated in the systems of different phyptographers: it is the Ramtilla *oleifera* of Decandolle; and two varieties, the wild and cultivated, are known. 3. Dr. Peck's remarks on the Aralia *hispida*, the bristly berry-bearing angelica, show that it might be efficaciously administered in medicine: to the advantages of an energetic diuretic operation, it unites that of being agreeable in taste, and more easily endured by the stomach than all the other remedies of the same kind. 4. When discoursing on the Ceanothus americanus, the New Jersey tea, Dr. Hubbard relates as a fact in history, that the leaves of this plant were employed as a substitute for tea during the period of the American revolution: these leaves are slightly bitter and astringent. 5. Dr. Antony exhibited the leaves of the Amygdalus persica, the peach tree, as a sedative in fevers of a remittent type, in some cases of cholera without vo-

miting, and frequently in the diarrhœa of infants, with the happiest results. An infusion of the leaves has proved an excellent remedy in hooping-cough, and their use might be profitably extended to other derangements of the nervous circulation. 6. In the canton of Richmond, in America, there exists a kind of clay which is sought by many persons, especially children, as food; Prof. Cotting has published an analysis of it, and found that 100 parts of it furnish, silica 31, oxide of iron 12, alumina 34, magnesia 10, water 12, with loss 1, and it presents vegetable without any trace of animal matters. 7. Mr. Froriep addresses an appeal to physiologists, and we transcribe it here, with a supplication to naturalists in behalf of the beetles and butterflies. Man, the philozoist observes, may *use* animals, but he may not *abuse* them. The necessity for instituting physiological experiments on living animals, we do not deny; but, for the sake of humanity, we may be allowed earnestly to entreat that, as soon as the object of the experiment admits, the animal may be put to death. Very often do we see experiments performed on living animals in cases where one just previously deprived of life would answer the purpose quite as well; and how frequently does it not happen that a mutilated creature is carelessly thrown away, and left to breathe out life, by slow degrees, in the cruelest of tortures! The writer once saw, in illustration of a lecture, the heart of a frog laid bare and beating. Four-and-twenty hours afterwards, he found the same animal on the same table, where it had been carelessly left lying, its heart still beating! If the sufferings of the poor animal be not regarded, it may perhaps be worth considering whether there may not be thus produced a hardening effect upon the minds of the youthful pupils of science, and whether society at large may not suffer through the consequences. If it be undesirable that a butcher should fill the office of a juror in cases affecting life, this presupposes an obtundity of feeling; and if here the slaughtering and subsequent cutting-up of animals produce such an effect, how much more must not the reckless dissection of living ones deprave the heart, and render it incapable of sympathizing with suffering humanity? Among the original communications is a contribution, by Mr. Marshall, to Statistics of the Mortality among Horses in Cavalry Corps serving in the United Kingdom, together with the number of horses cast, and some preliminary observations respecting the selection, training, and feeding, of horses belonging to dragoon regiments. This contribution proceeds from an intelligent and observant medical officer: his remarks may be perused with advantage by fox-hunters, steeple-chasers, race-riders, by the whole tribe, indeed, of those light-headed heroes who delight in the doings of the road, the course, and the turf; and, entertaining this notion, we recommend it to their especial consideration. There is a highly important and instructive analysis of Mr. Colquhoun's report of the proceedings under a "brieve of idiotry," with an appendix of relative documents, and an introduction: it exhibits a compendious view of the law applicable to such cases, and forms an excellent addition to the illustrations of medical jurisprudence. This Journal continues the long series of periodical literature which commenced at Edinburgh in 1731; and, while many cotemporaries or rivals have begun, or changed, or terminated their career, this work maintains its uniform course, exercising an influence, and conferring on the branches of science to which it is devoted, a moral and intellectual dignity altogether unparalleled in the records of philosophy.

The Magazine of Natural History, and Journal of Zoology, Botany, Mineralogy, Geology, and Meteorology; conducted by Edward Charlesworth, F.G.S. 8vo, London, 1838.

WHILE this excellent Magazine proceeded under the management of its original and enterprising Editor, it contributed essentially towards exciting an interest in the pursuits connected with the investigation of natural objects. In the hands of its present zealous and enlightened conductor, the Journal has well maintained its former high character in all respects; and, in many, it deservedly enjoys an increase of reputation arising from improvements in the exercise of its influences and their usefulness. With the opening of the year 1838, a new series of the Magazine was commenced, under the new editor's superintendence; and, in confirmation of our estimate of his labours and success, it is merely necessary to refer to the numerous valuable and judiciously diversified articles whereof the first volume is composed. This periodical is intended to form a channel for making known the discoveries and observations of those who are engaged in the study of natural history in any of its departments; and, with a scope so extensive and an aim so commendable, it evidently possesses strong claims for regard and encouragement from all who delight in cultivating the most interesting of the sciences. We introduce it, in sketches of the current volume, to our friends of *The Analyst*, beginning with

No. XIII., JANUARY, 1838.—In an English version of M. Adolphe Brongniart's curious and admirable reflections on the nature of the vegetables which have covered the surface of the earth, at the different periods of its formation. This article evinces much originality, both of observation and reflection: but the first sentence states, rather comically, that *curiosity* is one of the most distinctive *faculties* of the human mind. 2. Dr. Weissenborn gives the first part of an essay on the influence of man in modifying the zoological features of the globe, with statistical accounts respecting a few of the more important species: he concludes that there is no species whose natural relations have not been materially affected by human influence. 3. Mr. Thompson's notes upon the natural history of a portion of the south-west of Scotland, exhibit sketches of the Merops *apiaster*, or bee-eater, the Larus *islandicus*, or Iceland Gull, the Leptocephalus *Morrisii*, or Anglesea Morris, the Ianthina *communis*, or purple ocean-shell, and the Nemertes *borlasii*, or sea long-worm, which sometimes grows to twelve feet in length. 4. Dr. Clarke furnishes a sketch and description of a species of Argentine which he found upon the shore of the Firth of Forth: this highly-elegant little fish was found entangled in some masses of sea-weed left by the retiring tide, and this was its fourth occurrence upon the British coasts. 5. Mr. Westwood's communication on the *Coptosoma*, an anomalous group of hymenopterous insects, is illustrated with figures, chiefly of the upper wings, wherein the anomaly consists. 6. As a contribution to South African zoology, Dr. Smith characterizes eight species of the *Cordylus*, a saurian reptile, and these are—*C.* griseus, *C.* polyronus, *C.* nebulosus, *Hemicordylus* capensis, *Pseudocordylus* montanus, *P.* fasciatus, *P.* melanotus, *P.* algoensis, and *P.* subviridis. 7. An extremely valuable article on the generic characters of cartilaginous

fishes, with descriptions of new genera, comes from Prof. Muller and Dr. Heule. Of the Scythian family of Sharks, the characters of six genera—*pristiurus*, *chiloscyllium*, *hemiscyllium*, *crossorhinus*, *ginglymostoma*, and *stegostoma*—are delineated. In the second division of sharks, there are five genera—*charcharias*, *scoliodon*, *zygæna*, *tiniænobon*, and *leptocharias*, which are destitute of spiracles; and in the *galeocerda*, *lœodon*, and *galeus*, these organs are present. Five genera—*lamna*, *oxyrrhina*, *cancharodon*, *selache*, and *rineodon*—are distinguished: in them, every trace of a membrana nictitans eluded detection. 8. In remarks on the species of the genus Mustela, by the Prince of Musignano, the M. *erminea*, M. *cicognanii*, M. *boccamela*, M. *vulgaris*, M. *richardsonii*, M. *longicauda*, and M. *prænata*, with their localities, are distinctly specified. 9. Mr. Chambers particularizes the rarer indigenous plants growing in the neighbourhood of Tring, and he adds a just admonition to those botanical pedlars whose selfish rapacity in devouring specimens has occasioned the extirpation of many scarce vegetables. 10. Mr. Charlesworth's notice of the remains of vertebrated animals occurring in the tertiary beds of Norfolk and Suffolk, is transferred from the sixth report of the British Association. 11. Remarks on the production of chrystals, by Mr. Morris, report his opinion that, in our secondary strata, some of the sulphur has an animal origin, and is combined in a state of sulphuret and sulphate through all the argillaceous deposits. 12. Mr. Luxford relates his discovery of the Cucubalus *baccifer*, the berry-bearing chickweed, in the Isle of Dogs; and, in the mean time, he considers it as a naturalized plant. As articles of intelligence, we have a report concerning a female Orang recently added to the menagerie in the Zoological Society's gardens, and an account of scientific expeditions: and, for short communications, there are papers on the transmission of experience in birds in the form of indistinct knowledge; on the singular effect produced by change of temperature on small birds; and on the substitution of a new generic name, *Thetis*, for the second genus of Proteus in the class of infusorian animalcules.

XIV.—Notes on Mr. Cross's *Acarus*, by M. Turpin, who names it the *A. horridus*, in an English translation, are illustrated with a very distinct microscopic figure: the editor justly records his judgment that the foreign naturalist has not handled his subject in the most philosophic manner. 2. Experiments instituted by Mrs. Power with a view of ascertaining how far certain marine sestaceous animals possess the power of renewing parts which may have been removed, were attended with satisfactory affirmative results. 3. Another section is contributed to Dr. Wiessenborn's observations on the influence of man in modifying the zoological features of the globe. 4. With a description and figure of a species of Ray-fish, the sandy ray, not hitherto included in the British Fauna, Mr. Couch introduces this inhabitant of the ocean to the notice of English naturalists. 5. From a consideration of his observations on the existence of saline combinations in an organized state in vegetable structures, Mr. Bird deduces the opinion that the saline matters existing in the tissues of plants play a part in the economy of vegetable life which is as important as that of their other constituents; and that all principles, except carbon, hydrogen, nitrogen, and oxygen, are *not* foreign to vegetable structure. 6. Mr. Clarke communicates a second part to his illustrations of the geology of the south-east coast of Dorsetshire, with four sections of the stratification. 7. The generic characters of cartilaginous fishes, by

Prof. Muller, are resumed, with his descriptions of new genera—the triglochis, alopecinu, cestracion, acanthias, spinax, centrina, centrophorus, scymnus, læmargus, echinarhinus, squatina, pristiophorus, rhina, rhynchobatus, rhinobatus, platyrhina, trygonorrhina, sympterygia, uraptera, trygon, hemitrygon, himantura, pteroplatea, tæniura, hypolophus, urolophus, anacanthus, urogymnus, myliobatis, ætobatis, cephaloptera, and ceratoptera. 8. Dr. A. Smith's farther contributions to the natural history of Southern Africa, are his remarks on the Naja *nigra*, N. *gutturalis*, Vipera *ocellata*, Lacerta *elegans*, L. *tesselata*, L. *livida*, L. *tæniolata*, L. *intertexta*, L. *etenodactylus*, L. *undata*, L. *lugubris*, L. *capensis*, and the Algyra *capensis*. 9. Some mistakes of M. Coste, the French naturalist, are corrected by Mr. Owen, respecting the *allantris* of the kangaroo and its embryology. 10. Mr. Sowerby describes a new genus of Trochidea, belonging to the family of phytophagous gasteropodes: he designates it T. *morrisii*, and gives a good figure in illustration.—11. In a succinct note on the Raputia *aromatica*, Mr. Hancock advances his reasons for concluding that *Raputia* not only forms a part of the order *Cusparideæ*, but that it is itself a true and legitimate species of the genus *Galipea*: he trusts to find his statements confirmed by further investigation. 12. The observations upon the best mode of preserving marine productions, by Mr. Harvey, recommend themselves, by their manifest excellence, to the attention of the practical naturalist. For scientific notices, there are, the substance of a communication from Mr. Crosse to the Electrical Society; notes on the Angustura-bark and its botanical characters, on the Victoria *regia* and the Euryale *amazonica*; an extract from the report of the botanical society; an account of the discovery and denomination of a new species of antilope, the A. *nigra*, of which no other other individual has yet been seen in Europe, or indeed known to African travellers; and the latest information relating to scientific expeditions. Some instances of longevity in animals—a parrot and a nightingale—stand in the place of short communications.

XV.—M. Desnoyers, in an English version, offers some considerations upon the position in the Tertiary System, to which the faluns of the Loire and the crags of England ought to be referred; and upon the difficulty of determining their relative age, solely by the law of the proportional number of fossil species analogous to species now in existence: appended to these considerations, is a temperate and valuable note by the editor, and in this he regrets being compelled to notice an instance of undue appropriation on the part of the continental naturalist. 2. Meteoric observations made in Germany in November of last year, are communicated by a lady. 3. From Dr. Weissenborn, we have another portion of his essay on the influence of man in modifying the zoological features of the globe: his discussions here relate to the common wolf, and he closes them with the saying, "*Censeo lupum funditùs esse delendum.*" 4. With five figures for the exhibition of characters, Mr. Clarke concludes his illustrations of the geology of the south-east of Dorsetshire. 5. Mr. Dalrymple furnishes some account of a peculiar structure in the eyes of fishes, and this is represented in two well-executed diagrams. 6. A few notes on the British species of the genus Polypodium, by Mr. Newman, relate to the P. *vulgare*, P. *phegopteris*, P. *dryopteris*, P. *thelypteris*, P. *oreopteris*, P. *cristatum*, P. *filix-mas*, P. *dilatatum*, P. *lonchitis*, P. *fragile*, and P. *ilvense*: his synoptical view of characters, with the introductory remarks, are perspicuous and practically valuable. 7. Mr. Ogilby's charac-

teristic eloquence is successfully exemplified in his observations on Rules for Nomenclature.—For scientific intelligence, there are a note on the discovery of the allantois in the fœtal kangaroo; the lapse of one of the Royal Medals for 1837; information concerning the apteryx; and a report of the Botanical Society. As short communications, you find, a new locality for Polyommatus *arion*; a note on the crag-beds of Suffolk and Essex; remarks on the golden, sea, and bald eagles, and their nidification; and strictures on the proposed new name for Proteus the infusorian.

XVI.—Phytological science has acquired a rich enlargement in Dr. Unger's essay on the influence of the nature of the soil upon the distribution of vegetables. 2. Professor Owen's further illustrations of his discovery of the allantois of the kangaroo, an additional fact in the history of marsupial developement, are rendered more usefully interesting by judicious introduction of new and important physiological remarks. 3. and 4. Mr. Strickland and Mr. Westwood evince their zeal for improvement in the philology of natural history, by the remarks on Rules for Nomenclature. 5. Dr. Moore's observations on the occurrence of the Teredo *navalis* and Limnoria *terebrans*, in Plymouth Harbour, are conclusive in proving the existence of these formidable animals, and their depredations. 6. Remarks on the affinities of *Lythraceæ* and *Vochyaceæ*, by Sir E. F. Bromhead, are well calculated to facilitate the writer's object, and to render it practical. 7. In his descriptive and historical notes on the Cepola *rubescens*, the red band-fish, Mr. Thompson characterizes a specimen, nineteen and a half inches long, which was found on the coast of Ayrshire after a severe storm. 8. Dr. Mitchell describes certain deep and extensive beds, containing peculiar flints, in the neighbourhood of London: with the exception of various snail-shaped or leech-shaped bodies, fossil remains are rarely found in the flints of this locality. 9. For reasons adduced by him, Mr. Thompson conceives that Hunter's Delphinus *bidentatus*, Baussard's Hyperoodon *honfloriensis*, and Dale's Bottle-headed *whale*, are undoubtedly identical: the two former specimens were females, the latter a male, in his opinion. 10. A letter from Mr. Clarke explains his views with reference to the alleged occurrence of the bones of terrestrial mammalia in the red and coralline crags of Suffolk: he supposes these bones to have been washed or drifted into fissures of the crag, and there apparently stratified. 11. Dr. Weissenbsrn details the history of a Hydrophobia occurring among the Foxes in the kingdom of Wurtemberg and the neighbouring countries: this communication merits the best attention both of naturalists and physicians. 12. In observations on the Long-tailed *trogon*, the Prince C. L. Bonaparte describes this "lovely" bird, and registers it in the catalogues of science under the name of Trogon *paradiseus*, the paradise *curucui*: there is a single instance of this bird having been domesticated. As a short communication, Mr. Cox notices a curious fact in the habits of the Viper; and the fact is, indeed, very curious.

XVII.—Dr. Weissenborn produces an elaborate and remarkably interesting essay on the Bos *urus*, the zubr or ure-ox, in an additional section of his dissertation on the influence of man in modifying the zoological features of the globe. 2. In his outlines of a new arrangement of Insessorial Birds, including remarks on affinity and classification, Mr. Blyth treats his difficult subject with great learning, ingenuity, and precision. He resolves the whole class of Birds into three primary divisions—*insessores*, *gressores*, and *natatores*

—and he regards anatomy, when aided by every character which the manner of propagation, the progressive changes and other physiological data supply, as the only sure basis of classification. 3. Mr. Newman sets forth a few remarks on the Antennæ of Insects, in relation to the theory that these appendages are analagous to the ears of higher animals. He shows how we conclude not only rationally but inevitably, that mice, hares, and other animals remarkable for the acuteness of their hearing, are indebted for that very acuteness to the extraordinary developement of the external portion of their auditory instrument—a conclusion which supports or confirms the fundamental physiological principle, that the *size* of an organ is the chief measure of its *power*. He proves also, that the supposed auditory faculty of the antennæ is nothing more than a vague and wild theory, unsupported by reason, analogy, or facts. 4. Mr. Ogilby favours us with further observations on rules for nomenclature, and he concludes an erudite and "poluphlosboiophanous" lucubration with the ominous announcement, that he has now done with codes and codification. 5. Mr. Clarke writes a letter on the non-identity of Suffolk diluvium and crag, and he promises future illustrations. For short communications, you have an account of the capture of the Haliætus *albicilla* or white-tailed eagle, at the mouth of the river Orwell, on the Suffolk coast; a note on the locality of Brockite; and observations on the probable cause of the death of parrots and other birds confined in cages, with the necrotomical inspection of a cockatoo whose death was sudden.

XVIII.—Mr. Heysham advances some observations on the habits of the Charadrius morinellus, or dottrel, made in Cumberland during the summer of 1835; and, from the results of his own experience, he is convinced that this bird is not only a regular summer visitant, but annually builds on the Cumbrian mountains. 2. Dr. Weissenborn concludes his essay on the influence of man in modifying the zoological features of the globe, with his farther account of the ure-ox and its physiology. 3. His new arrangement of insessorial birds is continued by Mr. Blyth, and you will admire, as well as be instructed by, the outlines of his essay to accelerate the progress of scientific ornithology. 4. In a monograph of the genus Semnopithecus, Mr. Martin endeavours to distinguish and fix its characters. 5. In his additional remarks on rules for nomenclature, you find Mr. Strickland discussing these important questions—the retrospective operation of rules; the terminations in *idæ* and *adæ*; the real signification of the word *Simia*; the etymological meaning of names; the distinction between absolute and relative characters; the signification of the word *type*; and on euphony: how glorious as gladiators, are these nomenclaturists with their altisonant weapons. 6. Mr. Skaife contributes some miscellaneous ornithological notes, and his subjects are the smew, white partridge, stormy petrel, pomarine gull, red-breasted merganser, wild swan, and canada goose, which he seems inclined to rank among the "Birds of Europe." As scientific intelligence, the recent transactions of the Zoological Society are detailed; Mr. Newman's description of twenty-one new species of Popillia are enumerated; and the proceedings at meetings of the friends of natural history at Berlin are recorded in the form of historical notices. You have short communications on the Cicindela *hybrida* and the Cuscuta *epilinum*; on improvements in the microscope; on the bones of mammalia in the crag; on woodcocks breeding in Ross-shire; on docility in a rook; and on a new method of setting-up fishes.

BOOKS RECEIVED.

1. *Experiments and Observations on the Gastric Juice, and the Physiology of Digestion*, by William Beaumont, M.D., reprinted from the American edition, with Notes by Andrew Combe, M.D. 8vo, Edinburgh, 1838.—Our next number will contain an account of this extraordinary and instructive volume.

2. *The Moral and Intellectual School-Book*, by William Martin; 8vo, London, 1838.—A most respectable compilation, replete with truly useful knowledge.

3. *Essay on a New Genus of Fossil Multilocular Shells*, by D. T. Ansted, B.A.; 4to, Cambridge, 1838, with an admirable and vivid sketch.

4. *An Address on the advantages arising from the mutual support and encouragement given by rich and poor to Friendly Societies*, by John Lee, Esq., M.R.C.S.L.; 8vo, Bosworth, 1838.—A seasonable, philanthropical, and irresistible appeal, in which the author's generous proposition is proved to a demonstration.

5. *Address of the Baronets' Committee on the chartered rights and privileges of the Order*, by William Crawford, M.A.; 8vo, London, 1837.

6. *The Education of the Feelings*; 12mo, London, 1838.

7. *The Young Lady's Book of Botany*, with numerous illustrations; 12mo, London, 1838.—A good book and agreeable.

8. *Astronomy Simplified, or Distant Glimpses of the Celestial Bodies*, by F. B. Burton; 8vo, London, 1838.—Written in familiar language, and admirably adapted to attain the author's benevolent aim.

9. *The Testimony of History to the Divine Inspiration of the Holy Scriptures; or, a Comparison between the Prophecies and their fulfilment*, by the Rev. W. J. Butler. M.A.; 8vo, London, 1838.—The powerful and eloquent author is perfectly successful in showing that the testimony of prophecy is completely conclusive as to the Divine Inspiration of the Bible: his work is popular, and should be carefully studied by all *unphilosophical* christians.

10. *The Functions of the Cerebellum*, by Drs. Gall, Vimont, and Broussais, translated from the French by George Combe; also answers to the objections urged against Phrenology by Dr. Roget, Rudolphi, Prichard, and Tiedemann, by George Combe and Dr. Andrew Combe; 8vo, London, 1838.—A clever, convincing, and curious production.

11. *A Bibliographical, Antiquarian, and Picturesque Tour in the northern counties of England and in Scotland*, by the Rev. T. F. Dibdin, D.D.; royal 8vo, 2 vols, London, 1838.—An analytical account of these entertaining volumes is prepared for our next publication.

In Exchange.—*The London and Edinburgh Philosophical Magazine*, No. 76, May; 77, June.—*The Magazine of Natural History*, No. 13, January; 14, February; 15, March; 16, April; 17, May; and 18, June.—*The British and Foreign Review*, No. 10, April, 1838.—*The Annals of Natural History*, No. 1, March; 2, April; 3, May; 4, June.—*The Phrenological Journal*, No. 1, December, 1837; 2, March, 1838; and No. 3, June, the new series.

Mar.	9 o'clk, a.m. Bar.	9 o'clk, a.m. Atchd. Ther.	3 o'clk, p.m. Bar.	3 o'clk, p.m. Atchd. Ther.	Dew Point, deg. Fah. 9 a.m.	Dew Point, deg. Fah. 3 p.m.	External Thermometers. Fahrenheit. 9, a.m.	External Thermometers. Fahrenheit. 3 p.m.	Self-register. Lwst.	Self-register. Hhst.	Rain in Inches, read off 9 a.m.	Direction of Wind at 9 a.m.	Remarks.
1	28.56	41.25	28.57	43.0	38.5	40.5	39.5	42.0	34.0	44.0	.440	S.E.	Fine morning; overcast, p.m.; rain at night.
2	28.64	43 5	28.66	45.5	38.5	41.0	38.5	42.75	38.5	43.5	.260	N.N.E.	Rain when dew point was taken; fair soon after, continuing all day
3	28.74	43.0	28.73	43.5	36.5	36.5	37.0	40.0	36.0	40.5	.005	N.N.W.	Fine morning; clouded p. m.
4	28.58	41.5	28.57	41.5	35.0	36.5	35.0	36.5	31.0	37.0		N.	Slight deposition of sleet at 9 a.m.; rain and sleet nearly all day
5	29.11	41.0	29.26	42.5	36.0	37.5	37.0	41.75	35.0	42.5	.200	S.W.	Fine morning; overcast p.m.; rain at night. Wind very variable
6	29.19	44.0	29.21	45.5	35 5	34.0	44.0	46.5	39.0	47.5	.100	S.W.	Fine morning; showers towards noon; hail storm at 1 p.m.; fair after. Much
7	29.31	43.0	29.29	45.0	36.5	37.0	41.5	45.5	37.0	48.0	.050	W.N.W.	Very fair, a.m.; lt. shrs. p.m. [wind S.W., greatst pressure, 12lb., at 11 a.m.
8	29.58	41.5	29.67	44.0	34.5	33.0	40.0	43.5	36.0	45.0	.005	W.N.W.	Very fair.
9	29.75	40.5	29.66	44.0	33.0	39.0	34.0	44.0	32.5	45.0		W.N.W.	Dense fog, clearing up towards 10 a.m.; very fair.
10	29.58	41.5	29.32	45.0	36.5	40.0	37.5	44.5	34.0	45.0		S.E.	Very fair a.m.; overcast p.m.; rain at night.
11	29.21	43.0	29.23	46.5	38.0	40.0	38.5	48.0	36.0	48.5	.020	S.E.	Fine morning; very fair all day.
12	29.58	43.0	29.61	46.0	36.5	37.5	39.0	47.5	35.0	48.0		S.	Very fair.
13	29.58	45.0	29.51	47.0	41.0	46.5	41.0	47.5	38.0	48.0	.005	S.S.W.	Rain while dew point was taken at 9 a.m.; clearing up towards noon.
14	29.49	50.0	29.44	52.5	47.5	48.5	48.5	53.0	47.0	53.5	.010	W.N.W.	Overcast a.m.; brisk wind from S.S.W., greatest pressure 8lb. at 5¼ p.m.
15	29.43	46.5	29.44	48.0	35.0	34.0	41.5	47.0	39.0	47.5		S.S.E.	Fair all day. [from S. & S.W., greatest pressure 11lb. at 11½ a.m.
16	29.27	44.0	29.12	43.5	36.5	36.0	38.0	39.5	33.0	45.5		S.W.	Fair till 11½ a.m.; hail at ¼ to 1, ending in snow, ceased at 1½; much wind
17	29.93	40.5	28.92	43.0	30.0	34.0	39.0	41.0	34.0	43.0	.140	W.S.W.	Fair; overcast towards 11 a.m.; hail & snow p.m.; wind S.W., gt. prs. 12lb.
18	29.08	40.5	29.07	43.5	31.0	31.5	40.0	44.0	34.0	45.0	.020		Very fair.
19	29.06	43.0	29.07	45.0	38.0	37.5	38.0	45.0	36.0	45.5	.020	S.W.	Overcast with a slight deposition 9 a.m.; clouded p.m.; rain at night.
20	28.55	47.0	28.65	45.0	40.0	35.0	47.0	42.5	41.5	47.5	.020	S.S.W.	High wind from S.W., gtst. force 23lb at 4 p.m.; 22lb. often during the day.
21	28.73	41.0	28 78	43.0	33.0	36.0	39.0	40.0	33.0	42.5	.005	S.	Overcast with an occasional slight deposition
22	29.06	38.5	29.12	40.0	33.0	33.5	35.0	37.0	34.0	37.5	.040	W.N.W.	Snow at 9 a.m., snow & sleet at intervals; frosty and clear at night.
23	29.07	37.0	29.03	38.5	28 5	29.5	32.0	37.0	29.0	40.0	.020	W.N.W.	An occasional slight deposition of snow; overcast p.m
24	29.0	39.5	28.96	42.5	33.5	31.5	36.0	42 0	33.0	43.0		S.W.	Overcast a.m.; rain towards night.
25	29.21	41.0	29.39	44.0	31.5	32.5	41.0	46.0	35.0	47.0	.120	S.W.	Overcast 9 a.m.; very fair after.
26	29.55	42.0	29.56	45.5	35.5	41.0	39.5	48.5	32.0	49.0		S.E.	Very fair.
27	29.76	43.5	29.77	48.0	35.5	39.0	43.0	53.0	34.5	54.0		E.S.E.	A fog, clearing up about 9 a.m.; very fair
28	29.97	48.5	29.97	51.0	42.5	45.0	45.0	55.0	40.0	55.5		W.N.W.	Morning hazy; very fair.
29	29.99	47.0	29.97	52.5	39.5	43.0	41.0	58.5	36.0	59.5	.005	W.	Very fair.
30	29.96	52.0	29.82	46.5	44.5	47.0	45.5	61.5	40.5	62.0		S.	Very fair.
31	29.67	48.0	29.63	47.5	40.5	41.0	42.0	40.0	40.5	46.0		W.N.W.	Overcast all day; rain towards night.
Mean	29.26	43.23	29.25	45.07	36.51	37.88	39.79	44.97	35.93	46.59	.695	*Sum.*	

	Barometer. 9 a.m.		Barometer. 3 p.m.		Thermometer.		Dew Point. 9 a.m.		Dew Point. 3 p.m.	
Highest,	29.99,	29th	29,.97	29th	62.00	30th	47.5	14th	47.0	2nd
Lowest,	28.55,	20th	28.57,	1st	29.0,	23th	28.5	23rd	29.5	3rd

Height of the cistern of the barometer above the ground, 23ft. 6in.
Height of the cistern of barometer above the presumed mean level of the sea, 472ft. 6in.
Height of the external thermometers above the ground—Fah., 4ft. 6in.; Self-reg., 4ft. 6in.
Height of the receiver of the rain-guage above the ground, 38ft.

Apr.	9 o'clock a.m. Bar.	9 o'clock a.m. Atchd. Ther.	3 o'clock p.m. Bar.	3 o'clock p.m. Atchd. Ther.	Dew Point, deg. of Fah. 9 a.m.	Dew Point, deg. of Fah. 3 p.m.	External Thermometers. Fahrenheit. 9 a.m.	External Thermometers. Fahrenheit. 3 p.m.	Self-register. Lwst.	Self-register. Hhst.	Rain in Inches, read off 9 a.m.	Direction of Wind at 9 a.m.	Remarks.
1	29.68	39.5	29.66	42.5	30.0	30.0	35.0	39.0	27.0	39.5	.010	N.	Very fair.
2	29.58	39.5	29.51	44.5	23.5	31.5	36.0	44.5	29.0	46.0		S.S.W.	Fine clear morning; overcast p.m.
3	29.43	43.0	29.41	46.0	29.0	39.5	37.5	43.0	32.5	45.0		S.	Fine morning; overcast p.m.
4	29.41	48.0	29.52	49.5	42.5	39.0	49.0	51.0	41.5	52.0		W.S.W.	Fine morning; overcast with light rain p.m.
5	29.45	49.0	29.37	52.0	41.0	46.0	49.0	52.5	42.0	55.0	.015	S.W.	Fine morning, overcast with rain p.m.
6	29.17	53.0	29.2	53.5	50.0	49.0	53.0	52.5	46.0	54.0	.095	S.W.	Overcast, ending in light rain; rain at night.
7	28.95	53.0	28.67	54.0	48.0	47.5	49.0	51.0	47.0	51.5	.125	S.S.E.	Overcast; heavy showers; brisk wind from S.W., **greatest pressure 16lb.**
8	28.9	46 5	28.83	49.0	37.0	36.0	41.0	46.0	37.0	46.5	.495	W.N.W.	Overcast; fair after a gale from the West, greatest **pressure 15lb.**
9	29.25	45.5	29.31	47.0	30.0	35.0	43.0	46.5	36.0	47.0		W.N.W.	Fine morning; fair p.m.
10	29.41	47.5	29.43	53.5	46.0	50.5	46.0	56.5	40.0	58.0		S.	Overcast 9 a.m.; very fair.
11	29.59	54.0	29.52	59.0	49.5	49.0	51.0	60.5	49.0	61.5		S.	Very fair.
12	29.67	51.5	29.68	53.0	36.0	36.5	48.0	50.0	39.0	52.0		W.N.W.	Very fair.
13	29.75	48.0	29.65	49.0	33.5	33.0	42.0	47.0	37.0	47.5		W.N.W.	Overcast nearly all day; a brisk wind from W.N.W., **maximum press. 7lb.**
14	29.48	48.5	29.48	52.0	38.0	40.0	45.0	48.5	38.0	50.0		N.W.	Fine morning; overcast p.m. [at 7¼ p.m. **16lb; rain, hail, & snow, p.m.**
15	29.22	50.0	29.22	51.0	43.0	35.0	49.0	51.0	41.0	54.0	0.25	W.S.W.	Overcast with light floating clouds a.m.; much wind **from N.W., max. pres.**
16	29.18	45.0	29.18	43.0	34.0	34.0	39.0	34.0	34.0	41.0	.170	W.	Snow near all day; st. of hail & sleet a.m.; bsk. wind **W.N.W., grt. prs. 11lb.**
17	29.15	41.5	29.18	44.5	33 0	34.5	39.0	43.0	31.0	44.5	.100	W.N.W.	Overcast; hail storms of short duration; gale **W.S.W., max. 14lb at 10 a.m.**
18	29.24	41.0	29.29	43.5	25.0	33.0	38.0	39.0	32.0	45.0	.005	W.N.W.	Morning fair; overcast towards noon; snow p.m. **and during night; highest**
19	29.28	40.5	29.26	43.0	31.0	34.0	36.0	43.0	30.0	44.0	.065	W.N.W	Morning fair; overcast p.m. **[force of the wind 7lb.**
20	29.3	42.0	29.26	44.5	32.5	33.5	38.0	44.0	34.0	44.5	.005	W.N.W.	Overcast; light floating clouds with occasional gleams **of sunshine.**
21	29.14	41.5	29.02	46.5	29.0	36.0	40 0	48.0	31.0	50.0	.015	W.	Fine morning; overcast p.m.; rain at night.
22	28.66	44.0	28.25	45.0	39.0	39 0	39.0	42.0	34.0	42.5	.170	S.E.	A heavy deposition at 9 a.m.; clouded with light **rain nearly all day.**
23	28.87	45.0	28.79	48.5	40 0	39.0	42.5	50.0	38.0	50.5	.180	S.	Fine morning; overcast ending in rain p.m.; wind **very variable.**
24	28.97	45.0	29.06	48.5	41.5	46.5	41.0	49.0	38.0	51.0	.075	N.E. b N.	Depos. of rain at 9 a.m.; hail, rain, and thunder a.m.; **heavy rain at 3½ p.m.,**
25	29.33	46.5	29.35	48.5	43.0	45.0	43.0	26.5	40.0	48.0	.205	N.	Clouded all day; brisk wind and rain at night. [$\frac{1}{10}$**in. fell in 10 min.**
26	29.47	46.0	29.5	46.0	41.5	40.5	42.5	43.0	41.0	43 5	.030	N.	Overcast all day, with a brisk wind from the North.
27	29.48	44.0	29.47	45.0	35.0	39.0	42.0	46.0	34.0	46.5		N.N.W.	Overcast all day.
28	29.39	43.75	29.31	47.5	34.5	40.0	42.0	52.0	35.0	52 5		N.	Very fair.
29	29.24	44.5	29.22	47.5	32.5	36.0	43.0	45.0	33.0	45.5	.005	N.N.W.	Very fair; a slight deposition during the night.
30	28.97	45.0	28.96	46.5	38.5	36.0	42.0	47.0	36.0	47.5	.010	S.S.W.	Overcast all day; rain at night.
Mean	29.29	45.72	29.25	48.12	36.90	38.78	42.68	47.03	36.77	48.35	1.800	*Sum.*	

	Barometer. 9 a.m.	Barometer. 3 p.m.	Thermometer.	Dew Point. 9 a.m.	Dew Point. 3 p.m.
Highest,	29.75 13th	29.66 1st	61.5 11th	50.0 6th	50.5 10th
Lowest,	28.66 22nd	28.25 22nd	23.5 2nd	29.0 1st	

Height of the cistern of the barometer above the ground, 23ft. 6in.
Height of the cistern of barometer above the presumed mean level of the sea, 472ft. 6in.
Height of the external thermometers above the ground—Fah., 4ft. 6in.; Self-reg., 4ft. 6in.
Height of the receiver of the rain-guage above the ground, 28ft.

INDEX.

END OF THE EIGHTH VOLUME.