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Soulsby no. 835, p. 228-238, 428-436.

Soulsby no. 2677, p. 10-14.

A SHORT HISTORICAL SURVEY

OF

THE ANNALS AND MAGAZINE OF NATURAL HISTORY

From 1828 to 1932

IN May 1828 appeared the first number of a new scientific periodical, *The Magazine of Natural History and Journal of Zoology, Botany, Mineralogy, Geology, and Meteorology*, conducted by J. C. LOUDON, and published by LONGMAN, REES, ORME, BROWN, AND GREEN. The contents consisted of (1) Original Communications—not by any means all containing new scientific observations (*i. e.*, what we should call original research), but many of them general articles, interesting and stimulating to amateur naturalists, and comprehensible by ordinarily well-read people: *e. g.*, "Some Remarks on Natural History as a Means of Education", "The principal Forest Trees of Europe, considered as Elements of Landscape", "Some Remarks on the Habits of a Kingfisher"; (2) Reviews; (3) Collectanea—nature notes, or short research notes culled from other sources; (4) Miscellaneous Intelligence—personalia, reports of the Meetings of Scientific Societies (Linnean, Geological, Zoological), queries and answers, etc. The journal seems to have been most admirably adapted to rouse an interest in natural history in both young and old. Successive numbers were published at intervals of two months, and the first two volumes consisted of five numbers each; publication of vol. ii. thus began in March 1829, and of vol. iii. in January 1830; henceforward there were six numbers to a volume.

In succeeding years the interest was well maintained; the intelligent layman as well as the trained naturalist (by no means so distinct from each other then as now) must have found much to give them instruction and pleasure in such articles as "Contributions towards the Natural History of the Dodo (*Didus ineptus* Lin.), a Bird which appears to have become extinct towards the End of the Seventeenth or Beginning of the Eighteenth Century"; a note on the

Zoea, giving an account of J. V. THOMPSON's research, whereby it was established as being the larva of the common crab; "On the probable Number of Species of Insects in the Creation"; an article on *Lucernaria auricula* by GEORGE JOHNSTON ("I leaped for very joy, and said within myself, Surely the Creator of all holds *this* out to lure his rational creatures to study his works and search out his wisdom!"); and similar articles by the same writer on other beautiful and curious marine animals, such as *Caprella*, *Serpula*, etc.

In vol. vii. (1834) the journal becomes a monthly. In vol. viii. the tone becomes rather more serious; whereas earlier the majority of the articles were signed merely by initials or pseudonyms, now they are mostly signed in full.

In 1837, with the tenth volume, a new series was inaugurated, no longer conducted by LOUDON, but by EDWARD CHARLESWORTH; and with the second volume the title becomes simply *The Magazine of Natural History*. Illustrious names abound among the contributors —Sir W. J. HOOKER, RICHARD OWEN, JOHN EDW. GRAY, G. B. SOWERBY (both these latter on Shells), CHARLES LYALL; and one must notice an article by two of the most eminent of Continental zoologists, JOH. MÜLLER and HENLE, "On the Generic Characters of Cartilaginous Fishes, with Descriptions of new Genera" ("the article is in Dr. HENLE's own English, with a few revisions," says the editor). But many of the contributors had seceded, and at the close of vol. iv. of the new series (1840) there seemed to be not enough room for the *Magazine* and another journal which had shortly before made its appearance.

The first number of *The Annals of Natural History, or Magazine of Zoology, Botany, and Geology*, conducted by Sir W. JARDINE, Bart., P. J. SELBY Esq., Dr. JOHNSTON, Sir W. J. HOOKER, and RICHARD TAYLOR, and described as a continuation of the *Magazine of Zoology and Botany*, and Sir W. J. HOOKER's *Botanical Companion*, was published in March 1838 ("printed and published by R. and J. E. TAYLOR"). It was continued monthly, six numbers to a volume. Not only did the principal naturalists in the country contribute to the new journal, but Continental scientists also sent papers, or their more important contributions to the French and German periodicals were translated and made accessible to English readers. Of workers in this country may be mentioned J. E. GRAY, G. JOHNSTON, Sir W. J. HOOKER, G. BENTHAM, EDW. FORBES, RYMER JONES, W. S. MACLEAY, CHARLES LYELL, RICHARD OWEN, EDWIN LANKESTER—most of these being regular contributors; of foreign writers LOUIS AGASSIZ ("Prodromus of a Monograph of the Radiata and Echinodermata"), EHRENBERG ("Communication respecting Fossil and Recent Infusoria," and other papers), MEYEN the botanist, DUJARDIN ("On the Digestive Organs of the Infusoria"), MORREN, and SCHLEIDEN may be noted.

In 1840 the *Magazine of Natural History* was transferred to Richard Taylor, and merged with the *Annals of Natural History*, under the name *The Annals and Magazine of Natural History*, *including Zoology, Botany, and Geology*, the title under which it appears to-day. There was no new numbering of the volumes, the first number of the combined journal appearing as vol. vi. of the *Annals*. The following years contain many valuable articles, by naturalists of the eminence of Owen, Edw. Forbes, Alder and Hancock (on Nudibranch Molluscs), J. E. Gray (on new Mammals), W. S. MacLeay (on Australian Zoology), Bowerbank (on Sponges), John Goodsir (of Edinburgh), G. J. Allman, Lindley the botanist, W. B. Carpenter, H. J. Carter (working in India), P. H. Gosse (on Rotifers and " Saurian Reptiles "), Spence Bate (on Crustacea), M'Coy (on Palæontology), George Busk (on Polyzoa), Thos. Hincks (on Hydrozoa). Many of these were frequent contributors ; in addition, Continental botanists and zoologists are represented in every number by valuable papers, usually translated from originals published elsewhere ; thus Hugo Mohl, " Researches on the Structure of the Annular Vessels ", with a reply by Schleiden ; Meyen in a series of articles presents a summary of recent work in physiological botany ; de Candolle ; Brongniart on Palæobotany ; Louis Agassiz, " The Natural Relations between Animals and the Elements in which they live ". Two of the most interesting names in these early years are those of Darwin and Huxley. Darwin does not as yet appear *in propria persona*, so to speak ; but G. R. Waterhouse gives an account of " Carabideous Insects collected by Charles Darwin, Esq., during the voyage of H.M.S. *Beagle* ", the Rev. M. J. Berkeley presents a "Notice of some Fungi collected by C. Darwin, Esq., in South America and the Islands of the Pacific ", and other authors describe other collections made by Darwin. Darwin himself was on a Committee of the British Association which drew up a first code of Rules of Nomenclature, which is given in full (vol. xi. 1843). T. H. Huxley is represented by " Zoological Notes and Observations made on board H.M.S. *Rattlesnake* during the Years 1846–50.—On the Auditory Organs in the Crustacea. By T. H. Huxley, Asst. Surgeon, R.N." ; " Report upon the Researches of Prof. Müller into the Anatomy and Development of the Echinoderms. By Thomas H. Huxley, F.R.S." (readers of Huxley's Life will remember his admiration for the work of Johannes Müller ; it is interesting to find that in this paper too Müller's researches are held up as models) ; and other contributions also, such as one on the Radiolarian *Thalassicolla*, with a plate drawn from nature by himself.

Meanwhile, anonymous or pseudonymous articles have ceased ; all the papers are now signed, and are serious contributions to scientific research ; but, even so, one cannot help remarking how much more *interesting* zoology and botany were in those days than now—or, at least, a zoologist or botanist could certainly then read with pleasure and profit a far greater proportion of published original papers than one of us can in most of our journals of to-day. English microscopists will note with interest the account, amongst others, of a meeting of the Microscopical Society, on October 20th, 1841, with R. OWEN, Esq., F.R.S., President, in the Chair, when the Secretary, Mr. JOHN QUEKETT, read a paper "On the Minute Structure of Bat's Hair".

Apparently the first appearance of the name of FRANCIS is in the Preface to vol. i. of the Second Series, January 1848, after twenty (half-yearly) volumes of the *Annals* (the short title by which the journal was at this time known and referred to, as it still is) had been completed :—"The editors continue to avail themselves of the aid of Dr. WM. FRANCIS, whose services they take this opportunity of acknowledging, as from the commencement of the Work they have had the advantage of his constant and valuable assistance in its regular superintendence." From 1852 onwards the journal is "Printed and published by TAYLOR AND FRANCIS", the names which appear on its cover to-day.

For the rest of the history of the *Annals* we can take only a few glimpses into the Tables of Contents, at considerable intervals. In the early volumes of the Third Series, beginning in 1858, we meet many of the old familiar names—H. J. CARTER (still working as Surgeon in the East India Co.'s service), P. H. GOSSE, J. E. GRAY, SPENCE BATE, ALLMAN (who gives us here figures of the gonophores of the Hydromedusæ which are still in use as diagrams in text-books and lecture-rooms), and others. EDW. FORBES, STRICKLAND, and GEORGE JOHNSTON are dead ; new arrivals include PHILIP LUTLEY SCLATER (Birds), ALBERT GÜNTHER, STRETHILL WRIGHT, HINCKS (Zoophytes), W. BAIRD (Crustacea), W. K. PARKER, A. M. NORMAN (Crustacea, in a series of "Contributions to British Carcinology") ; DARWIN writes "On the Agency of Bees in the Fertilization of Papilionaceous Flowers, and on the Crossing of Kidney Beans" ; the philosopher G. H. LEWES, whose main work lay in another field, has a paper "On the Chylaqueous Fluid of the Actiniæ", and H. W. BATES one on "Contributions to an Insect Fauna of the Amazon Valley. Coleoptera ; Longicornes". Foreign authors still contribute largely, important papers being seized on and translated (whether with or without authorization does not appear !) ; so we have KROHN, LILJEBORG, FRITZ MÜLLER (on Parasitic Crustacea, and on *Liriope*), SARS, LEUCKART (on *Sacculina*, and other forms), H. G. BRONN ("On the Laws of Evolution of the Organic World during the Formation of the Crust of the Earth", a month or two before the theory of Natural Selection was given to the world by DARWIN and WALLACE at the Linnean Society), and many of VON MOHL's botanical papers.

In the next decade a glance at the lists of Contents shows, besides many of the former names, those of W. T. BLANFORD, WYVILLE THOMSON ("On the 'Vitreous' Sponges" and "On the Depths of the Sea"), G. S. BRADY (Entomostraca), W. C. M'INTOSH (Annelids), PERCEVAL WRIGHT, C. T. HUDSON (Rotifers), PICKARD-CAMBRIDGE (Spiders), SAVILLE KENT (Corals). Particularly notable are papers by DARWIN (1869—"Notes on the Fertilization of Orchids", appearing *after* his book on the subject, noting a number of new facts, and bringing the bibliography up to date), and by RAY LANKESTER. That by the latter, appearing in 1868 ("On Lithodomous Annelids"), deals with the boring of stones by Annelid worms, and must be his first paper, since he is described as "Junior Student of Christ Church, Oxford"; in a later paper (1869—"On the Existence of distinct Larval and Sexual Forms in the Gemmiparous Oligochætous Worms") he is "B.A. Oxon." At this time the number of borrowed and translated papers is almost as great as that of the original contributions; these borrowed papers are always interesting, and usually of considerable theoretical importance: *e.g.*, J. C. SCHIÖDTE, "On the Development of the Position of the Eyes in Pleuronectidæ" (this appeared in the *Annals* at the same time as, or before, its publication in the *Naturhistorisk Tidskrift*); ANTON DOHRN, "On *Eugereon boeckingi* and the Genealogy of the Arthropoda"; SARS, "Remarks on the Distribution of Animal Life in the Depths of the Sea"; VON SIEBOLD, "On the Law of Development of the Sexes in Insects"; and papers by FRITZ MÜLLER, STRASBURGER, C. SEMPER (two original papers of his also, besides those borrowed from elsewhere), several by HAECKEL, as well as by the American authors O. C. MARSH (Cretaceous Reptiles) and VERRILL.

In the late '70's the Preface to the Fifth Series notes that "Even foreign naturalists seek admission for their writings" to the *Annals*. Botany is still represented in its pages. BOWERBANK, J. E. GRAY, and others are dead; but OWEN is still writing (on the Dodo, and other papers), and so are BRADY (on the Radiolaria), H. J. CARTER (a frequent contributor), SAVILLE KENT, GÜNTHER, HINCKS, SPENCE BATE, PICKARD-CAMBRIDGE, A. M. NORMAN, and other old friends. We make the acquaintance of T. R. R. STEBBING (Crustacea), W. J. SOLLAS (Sponges), WOOD-MASON, the Deputy-Superintendent of the Indian Museum (Entomology), HUTTON (*Peripatus*), H. N. MOSELEY (on *Bipalium kewense*, a land-Planarian, and on *Peripatus*), BOWDLER SHARPE (Birds), DUCANE GODMAN and OSBERT SALVIN (Central and South American Insects), and RAPHAEL MELDOLA, best known as a chemist, but honoured also for his work in Entomology ("Entomological Notes bearing on Evolution"); while MERESCHOWSKY has many contributions on the Hydrozoa, one with the alluring title "On an Anomaly among the Hydromedusæ and on their Mode of Nutrition by Means of the Ectoderm", and FRITZ MÜLLER is again represented by a (borrowed) paper on the Nauplius stage of the Prawns.

We come thus to a time when naturalists who are still living begin to contribute, perhaps the first being D'ARCY THOMPSON, who in 1878 writes on Hydrozoa from Australia and New Zealand; and beyond this we will not extend this already lengthy survey. Soon afterwards Botany ceased to be included in the subjects of the *Annals*, and the journal came to consist, as at present, of Zoology and Palæontology. As years went on, and Zoology widened its scope to include genetics, cytology, experimental embryology, comparative physiology, and other branches, other journals sprang up, and specialization became necessary ; so that the scope of the *Annals* has now come to be largely restricted to Systematic Zoology (including Palæontology), with, however, a considerable element of " Biology " (in the narrow sense) or Ecology, and a few structural or morphological papers. As was hinted above, no zoological journal at the present day can possibly match, for interest and variety, the *Annals* during its first fifty years. No one nowadays is likely to sit down to read through one of the monthly numbers for pleasure ; one or two articles will be all that will capture any single reader's interest ; the rest will remain there for reference when required by his work or his further studies.

Our journal makes a cosmopolitan appeal. It can still be said, as it was said more than fifty years ago, that " even foreign naturalists seek admission for their writings " to the *Annals*. Last year (1931) the journal opened its pages to eleven American authors, of whom several contributed more than one paper, T. D. A. Cockerell's series " Descriptions and Records of Bees ", begun in 1905, reaching No. CXXIX. and C. P. Alexander's series on the Tipulidæ No. XLIX. ; to several French, Japanese, and Indian contributors ; and to one or more Russian, Austrian, Hungarian, Finnish, German, and Norwegian zoologists, as well as to workers in other parts of the Empire—South Africa and Australia.

The value of Systematic Zoology is generally understood, though perhaps still occasionally liable to depreciation. The first requisite in zoological work of any kind—morphological, economic, or any other—is to know what one is dealing with ; before we can so much as begin on any other problem, we must know what our animals are—must have them described, named, and classified ; and Systematic Zoology, which does this, is thus the bed-rock on which all other zoological research ultimately rests. Such work stands for all time ; the first adequate description of a new animal is something which can never be duplicated, never repeated ; it is there, once for all, as something to be appealed to, something that cannot, by the rules under which the systematist works, be superseded. It may seem to be of little interest at the moment ; it may not be recalled for years ; but it will be required, and will come into its own when much work in other branches has become obsolete through change of fashion or improved technique, or has been shown to be useless for any further advance.

Of the *Annals*, then, forming as it does a storehouse of this essential knowledge, always valid and always in demand, it can with absolute certainty be said that the volumes are not only valuable to-day, but that their value increases as time goes on, and adds successive numbers to the imposing series of the last hundred years.

John Stephenson.

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THE

MAGAZINE OF NATURAL HISTORY,

AND

JOURNAL

OF

ZOOLOGY, BOTANY, MINERALOGY, GEOLOGY, AND METEOROLOGY.

CONDUCTED x24

By J. C. LOUDON, F.L.S. G.S. &c.

MEMBER OF THE ZOOLOGICAL SOCIETY OF LONDON, AND OF VARIOUS NATURAL HISTORY SOCIETIES ON THE CONTINENT.

VOL. I.

LONDON:

PRINTED FOR LONGMAN, REES, ORME, BROWN, AND GREEN, PATERNOSTER-ROW.

1828 – 1829.

London:
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New-Street-Square.

PREFACE.

The First Volume of the Magazine of Natural History is submitted to its readers, as a fair specimen of what that Periodical is intended to be; subject, however, to such improvements as may, from time to time, suggest themselves to its Conductor.

The Introduction (p. 1.) describes the objects it proposes to embrace: — 1. A more general diffusion of a knowledge of Animals, Vegetables, and Minerals, technically and physiologically; of their commixture and disposition under the earth's surface, or Geology; and their disposition over it in the atmosphere, as Landscape scenery. 2. A record of discoveries in these branches of knowledge; and of the actual state and progress of the taste for Natural History, in different parts of the British empire, and throughout the world. 3. A summary of the progress of discovery in natural science during the past year.

In conformity with these objects, original communications, introductory to Linnean Botany, will be found, p. 124. 228. and 429.; to Jussieuean Botany, p. 30. 135. 238. and 333.; to Zoology, p. 97. and 309.; to Ornithology, p. 121.; to Entomology, p. 421.; to Geology, p. 249. and 442.; to Meteorology, p. 147.; and to Landscape scenery, p. 37. and 242. Of new facts or theories, it is not to be supposed that many can have occurred, or come to our knowledge, since this Magazine has been in existence; but the discoveries of Professor Nees von Esenbeck, M. Franz Unger, and others, on the Metamorphoses of the Reproductive Bodies of some *A'*lgæ, p. 306.; the researches of Mr. Brown, M. Brongniart, and M. Raspail, on the particles of the Pollen of Plants, and on the ultimate particles of matter in general, p. 473.; and of Dr. Martius, on the Structure of Plants, p. 475.; have been recorded, or noticed, preparatory to more complete details.

The Miscellaneous Intelligence and Collectanea of this Magazine (see Contents, p. vi.) contain a various assemblage of original communications, and extracts from published works, detailing the local state and progress of Natural History in the different counties and cities of Britain, in North and South America, in Australia, and in other parts of the world. In these two departments of the work, as well as among the Original Communications, will be found numerous fragments of information, presented in various forms and combinations, with a view to keep alive the interest of the general reader; and gradually, and in an agreeable manner, to store his mind with facts.

With respect to an Annual Summary of Discoveries, after consulting some of the principal naturalists of France and Germany, we are convinced it is impossible to do this as we intended; viz. to give those of every year at its termination; because, the materials for the year cannot be got together for weeks, or even months, after the year is completed. The attempt, we are informed, has been made without success; and we are not sure that we shall run the risk of having our efforts added to the number of failures. At any rate, we shall not attempt such a summary for the year about to be completed, till an advanced period in the next year; and, in the mean time, if our readers do not calculate on receiving any further summary in future Volumes than what can be given in such a Preface as the present, they will, at least, not be disappointed. They may rely, at the same time, on our being sufficiently alive to our own interest, not to neglect such a summary if it shall be found practicable, and can be done well. We date this Preface from the city of Naturalists, and the best sources of information on all that relates to Natural History.

J. C. L.

Paris, Dec. 16. 1828.

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Erratum.

Page 403. line 5. from bottom, *for* James L. Drummond, Esq. M.D. F.L.S. *read* the Rev. Thomas D. Hincks, M.R.I.A.

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THE MAGAZINE

OF

NATURAL HISTORY,

MAY, 1828.

INTRODUCTION.

In order to point out the agreeableness and utility of the study of Natural History, we shall commence by taking it for granted, that all knowledge is pleasure as well as power. If any man doubts this, we refer him to the first page of Mr. Brougham's *Preliminary Discourse on the Objects, Advantages, and Pleasures of Science*. In this Introduction, we shall chiefly endeavour to show that the pleasure and the power obtained will be in direct proportion to the labour bestowed.

To know any thing does not consist in having merely seen it, or in recollecting its name; no naturalist can be said to know a plant, unless he knows its rank in the vegetable kingdom, its structure, habits of growth, the climates and countries in which it abounds, its history in its wild state, and, if a cultivated plant, its domestic history, its culture, properties, and uses.

The tulip and the ranunculus are known to every body, and are deservedly two of the most admired productions of professional florists. There is no child who cannot name them at sight, and no gardener who does not know a great deal about their culture: but how few, among either gardeners or botanical amateurs, know that these two plants, however nearly they may be allied as fine flowers, are very different in point of rank in the scale of vegetable creation; that they belong to separate fundamental divisions of plants, the organisation of the one being much more perfect than that of the other; and that they display wholly different characters of structure and physiological economy, from the seminal embryo through every stage to the perfect plant! Thus the ranunculus, belonging to a division of plants characterised by a reticulated structure of all their parts, admits of portions of its leaves being broken off, without impeding the remainder of the leaf in the performance of its functions; while the tulip, belonging to a division characterised by a parallel fibrous structure of all the parts, does not admit of part of the leaves, and particularly of their extremities, being cut off, without impeding their functions, and consequently injuring the present health of the plant, and influencing its vigour for the following year. But any one who is so far a vegetable anatomist and physiologist as to know the distinctive structures of these two divisions (Monocotyledòneæ and Dicotyledòneæ), if he should see only a part of the leaf of a tulip or of a ranunculus, would be able to ascertain the division to which it belonged, and, by consequence, the essential principles of the culture and management of the plant, as far as respects the most important organs of plants, leaves being analogous to the lungs of animals.

Such is the difference between knowing a plant as a gardener or an amateur, and knowing it as a physiologist. There must evidently be a superior degree of pleasure in combining both descriptions of knowledge, and as evidently an advantage in point of utility; for though the mere cultivator might be aware of the effect of cutting or mutilating the leaves of the tulip and ranunculus from experience in the management of these two plants, yet not knowing it from principle, the knowledge could only be of use to him in this particular case, instead of being of use as applied to two of the three grand divisions of the vegetable kingdom.

There is a positive source of pleasure in knowing the species of plants individually. Every plant of which we acquire a knowledge by sight, so as to be able to recognise it again when it comes in our way, is not only a distinct source of pleasure at first, but the pleasure is repeated and increased when we see it for the second and third times, or after some time, or in other circumstances relatively to ourselves or to the plant. In this way, with no other knowledge of plants than that of being able to name them when we see them, and, consequently, to communicate our ideas respecting them to others, they may prove sources of the most interesting associations. But even this pleasure, derived from what may be termed the trivial knowledge of plants, may be greatly enhanced by extending our views to circumstances connected with them not strictly botanical. Thus we may view them with regard to their geological relation in any particular country, their geographical distribution relatively to the world, their migration from one country to another, their relation to climate, their being domestic plants following man, their being social (growing in masses) or solitary, their being abundant or rare, their natural modes of propagation, their natural enemies or friends whether among other plants or among animals, their history with regard to man, and their properties, uses, and culture.

A mere general lover of plants, therefore, who knows no more of them, in a strictly botanical sense, than their names, may add greatly to the pleasure which he derives from this taste, by simply acquiring something of that knowledge which may be called the biography of plants. It must be evident that cultivators, by adding to their stock of this description of knowledge, would not merely add greatly to their enjoyments, but would also contribute to their professional improvement, would add to their power as well as to their pleasure.

Those of us who know nothing of scientific zoology, still derive much pleasure from observing the great variety of forms, habits, and powers of the animal kingdom; and nothing is more common than for man to form attachments to particular animals. We transfer the human virtues to some of the nobler quadrupeds, and admire the courage of the horse, the sagacity of the dog, the docility of the ox, the patience of the ass, and the observant mimic powers of the monkey tribe; we are delighted with the singing of birds, instructed by the industry of the bee or ant, pleased with the gaiety of the butterfly, and amused or annoyed by various other insects or reptiles. But what is this interest in animated nature compared with the enjoyments of a scientific zoologist? The man who can trace the powers of the Author of nature, exerted in various degrees and for various purposes, through all the different orders of animated nature, from the most minute insect or obscure mollusca, endowed with unerring instinct, up to the intellectual powers of rational man, and who knows scientifically that man is the most perfectly formed of all animals, lives in a different world from the mere general observer, and enjoys that more exalted pleasure which can be given by scientific knowledge only.

Nor need the young student, who aspires to become a zoologist, be discouraged from attempting to obtain his share of the superior delight scientific knowledge can afford, by the obstacles that apparently oppose the acquirement. Every step in the pursuit produces a reward and a gratification, in exact proportion to its difficulty; and every advantage thus gained becomes a fresh inducement to proceed. The geographical distribution of the various animated beings which surround him, invests each untried locality with new charms, and presents to him, on all sides, fresh objects to repay his researches. Their forms, habits, powers, and structure are all so many indices to the great work he is every day invited to peruse.

To point out to the learner the most proper objects of attention, or the best mode of arriving at a competent knowledge of their various peculiarities, does not come within the limits of the present Introduction; yet the gradations observed in the great field of animated nature indicate the preliminary steps for the commencement of his operations.

The occasional and sometimes alternate developement of internal and external organisation, each division advancing in the degree of its perfection as the animal rises higher in the scale, seems to indicate the natural order of progress. The slow and creeping caterpillar sinks into a state of lethargy, ultimately to burst forth with organs and powers of locomotion the most opposed to its former condition.

Fishes, reptiles, and birds furnish additional examples of an adaptation of parts, admirably suited to the exigencies of the animals, yet possessing and affording capabilities of the most opposite character; and the rudiments of extremities furnished to the cetacea, become ultimately perfected in animals of the same class, for the individual but opposite powers of climbing, burrowing, flying, prehension, and speed.

Thus agreeably led on, the zoologist is brought by degrees to the contemplation of man, the image of the Creator of all; and finds that, although man does not in himself possess all the different qualities of the organs of each individual beneath him, yet he presents, in the varied and extensive combination of his powers, that balance of perfection, which, independently of mental endowment, stamps him the head of his own as well as of every other class.

The study of mineral bodies is of the greatest importance: for what would civilised man be without iron? The different ores, and the various useful or precious stones, display great variety in structure, colour, and other properties. Many species are highly beautiful, others are prized for their rarity, and all are interesting with reference to crystalography, systematic arrangement, and the useful arts. The study of mineralogy is intimately connected with that of geology; and the utility of both, in the discovery and working of quarries and mines, is sufficiently evinced by the stones and metals which enter into the construction of our houses, roads, machines, and implements.

An acquaintance with the leading facts of geology adds greatly to the interest of the traveller in passing through any country. Whether mountain or plain, hill or valley, solid rock or detached stone, gravel, sand, or alluvial soil presents itself, the mind of the geologist is carried back to former revolutions; in short, to him every part of the earth's surface may be said to speak of its history. How much greater, then, must be the pleasure of the geologist than that of the common observer! The ploughman, who views in the field of gravel which he turns up the bed of a former ocean, and in that gravel the remains of rocks or mountains of a more remote period, is he not gratified with the mere idea? How many interesting associations are connected with the fossil remains which the labourer turns up in digging drains or ditches, or crushes to pieces in the humble occupation of breaking stones for mending roads! Geology not only discovers to us the awful revolutions which have in former ages changed the surface of the globe, but it unfolds to our view the forms of strange and unknown animals buried in the different strata, presents us with the zoology and botany of the former world, and even enables us to contemplate the nature of the future revolutions which the globe we inhabit is destined to undergo.

Some knowledge of meteorology, as it regards the weather, is common to all men without exception; but even to this everyday subject, science has lent additional interest. It is one thing to look at the clouds with a common eye, and another thing to observe them with the eye of a Forster or a Howard. The countryman and the sailor know to expect in March and September the equinoctial gales, but the meteorologist knows the reason of their occurrence at these seasons. When we consider what has been done, or is now doing, by lightning rods, hail protectors, marine barometers, &c., the utility of this science is much greater than at first sight may appear.

The common phenomena of thunder, lightning, meteors, hail, rain, snow, frost, dew, fog, and vapour, by our taking a little pains to increase our information respecting them, are all capable of affording increased degrees of interest and pleasure. And let the learner never forget, that in the pursuit of pleasure, as in every other pursuit, the amount of gratification will always be in proportion to the labour employed.

Notwithstanding the very limited knowledge which exists among country people of the objects of natural history, as a science, it is certain that this must have been one of the earliest subjects of human attention, from the necessary dependence of man on certain plants and animals for food, and from the influence which the weather and climate must have had on his dress and the construction of his dwellings. In different countries and climates, different animals and plants would attract his attention; but in all countries the first objects of human solicitude must have been animals, plants, the soil, and the weather. The study of natural history, therefore, is the most primitive and congenial of studies; as gardening and agriculture, arts which are founded on it, are the most primitive and congenial of occupations. As these arts are the preliminary occupations in new countries, and as the first step in the civilisation of savages is to supply them with useful plants, animals, and implements of culture, so the study of natural history, the observation of the habits and peculiarities of plants and animals, is the fittest to commence with, and the best calculated for improving uninformed minds.

The study of natural history we consider to be in an especial manner calculated for raising the character of the labouring classes of a community. It may be said to be a study which they have, to a certain extent, already engaged in; it requires less preliminary information than any other study, and cannot by any means be considered dry or severe, since it requires habits of observation chiefly, and every step is likely to be attended by some acquirement intimately connected with, and beneficial in, the pursuits of a country life. The humblest and most laborious individual, after fulfilling all his duties to his employer and his family, has still a portion of leisure; and with him, as with man in every class of society, happiness will be found to depend much more on the manner in which this leisure time is spent, than on the nature of his professional or mechanical occupation. But not only does the happiness of the laborious classes depend on the manner in which they spend their leisure time, but also their chance of raising themselves to a higher condition in society. The pursuits of natural history, besides their suitableness to the former object, are, it is obvious, particularly adapted for advancing the interests of gardeners and agricultural labourers.

The study of natural history is well calculated to have a beneficial influence on the moral sentiments and conduct. While various other descriptions of knowledge are cultivated to improve the reasoning powers of the mind, their influence on the heart and affections is comparatively remote. Natural history has a different effect, and may be said to improve and humanise the whole man. It is perfectly natural to man to regard with affection the living things which surround him; and every one must feel that the better these things are known, the more they will be loved. If man born and educated in cities has less interest or affection for animals and plants, than man born and educated in the country, it can only be because in the latter state he is more familiar with them, and knows more about them. The connection between moral conduct and the love of animals and plants, may be thought intimate or remote by different individuals; but the more we trace design and purpose in the works of nature, shall we not sympathise the more with the fitness of means to ends in human conduct? The more we enter into the details of nature, shall we not increase our taste for facts? which is, in other words, the love of truth, the foundation of justice and honesty. It is unnecessary to trace the influence of the study of natural history from individuals to nations, and its tendency to universal intercourse, civilisation, and peace. For these reasons, amongst many others, the study of natural history is particularly adapted for the earliest education of young people; and this idea is confirmed by the rapid progress which children make in this study whenever it has been considered a fitting acquirement. Infants, who have made but little progress in languages or sciences of reasoning and reflection, have yet made considerable progress in the observation and recollection of natural objects.

Natural history is the parent of natural religion. To know and to acknowledge the Author of nature, are precepts inculcated by the religion and morality of every civilised people; and the history of the world shows that most nations have had some way of what they considered knowing God, and some particular reasons which they assigned for loving and reverencing him. Without interfering with that knowledge of God which is obtained by revelation, or with those reasons for loving him which are deduced from the doctrines of particular religions, natural history arrives at a knowledge of the Author of nature, by enquiring into the skill and contrivance manifested in his works, calls forth our affections towards him in loving those of his works which contribute to our happiness, and leads us to adore him in the contemplation of the superhuman power and wisdom displayed in the general system and particular contrivances of the world and its various details. "He," observes Linnæus, "who does not make himself acquainted with God from the consideration of nature, will scarcely acquire knowledge of him from any other source; for if we have no faith in the things which are seen, how should we believe those things which are not seen?" *

For this reason, the knowledge of the Author of nature, through his works, may be called the universal religion, as the

* Reflections on the Study of Nature, p. 21.

love of fitness, induced by a taste for facts, may be called the universal morality. Neither interferes with the religion or morality of any particular country, climate, or people.

An extended knowledge of natural history will not take place without producing corresponding improvements in taste, literature, and the elegant arts. A knowledge, in readers and spectators, of natural forms and appearances, will demand a greater accuracy in the delineation of them by the artist and the man of letters. The public taste in painting, sculpture, and architecture is gradually improving; and no inconsiderable part of the improvement will be found to consist in the more correct representation of natural objects. The same improvement in taste has extended to our different manufactures, and especially to the figures printed on cotton, paper, and earthenware; the superiority in these and other articles of British manufacture, is acknowledged to consist, in a great degree, in a more correct imitation of plants, animals, and general scenery.

Such are the pleasures and advantages of the study of natural history. The main object of this Magazine is to render a taste for this study more general among all classes of society. In order to extend it among readers of leisure and general observation, and also among gardeners, farmers, and young persons resident in the country, we propose to subject every part of the science to discussion; to invite every reader to communicate every circumstance, even the most trivial, respecting the native habits and economy of animals, the habits and habitations of plants, the localities of minerals and strata, and respecting peculiar or striking states of the atmosphere; to encourage all who are desirous of information, to propose questions, to state their doubts, the kind of information they desire, or their particular opinions, on any part of the subject. Observations which, at first sight, may appear trivial, are often truly valuable when viewed in reference to general conclusions; and this kind of information may be furnished by persons wholly unacquainted with natural history as a science, but who, by such exercises, are adopting the most certain and efficacious means of becoming scientific observers. In this way we hope to call forth a new and numerous class of naturalists.

We intend, also, for the benefit of such as have never paid any attention to the elements of natural history, to give a series of introductory papers in each of the five departments; and after these are completed, to give a general view of the subjects of each department. These papers will necessarily extend through several volumes; but they will, in the end, display an introduction to natural history, in what we consider to be by far the most desirable form and manner of publication for giving effect to our intentions.

Our second object is, to collect scattered facts and new discoveries. Individuals are now occupied in every part of the globe, in discovering new objects, or in explaining the nature of those already known. New productions and new facts are thus rapidly accumulating; it shall be our business to record them as they are discovered or ascertained, and at the end of every year to present their essence to our readers in a general summary

If we can attain these two objects in the manner in which we hope to do, whoever makes himself master of our introductory papers, and regularly peruses the other parts of the Magazine, will, for all the ordinary purposes of use and enjoyment, be a practical and scientific naturalist; will know all that is already known, and worth remembering, on the subject, and be made acquainted with every thing new or interesting as it occurs.

In conclusion we repeat, with a view of impressing them on the mind of the young reader, the fundamental truths with which we set out; first, that all knowledge is pleasure, as well as power; and secondly, that in the pursuit of pleasure, as in every other pursuit, the reward obtained will be commensurate with the labour bestowed. These are facts in accordance with reason and experience, and ought to be treasured up in the mind of every young person, as perpetual incitements to exertion.

PART I.

ORIGINAL COMMUNICATIONS.

Art. I. *Some Remarks on Natural History, as a Means of Education.* By J. E. B.

It has been the fashion, in modern times, to depreciate the discoveries of Linnæus, and to put forward other eminent naturalists as rivals for popular favour at his expense. Nothing can be more unjust towards the memory of departed greatness, nothing can be less acceptable to existing merit, than the attempt to build up their fame by disparaging that of another. Now, although it must be acknowledged that the naturalists of this country have confined their studies too exclusively to the nomenclature of science, and have overlooked too much the end for which language is invented, let us not be so absurd as to shut our eyes to the real merits of Linnæus, because we have witnessed some abuses of his system. His great claims to our admiration rest upon ground independent of that which is generally taken up against his disciples; and this will be found tenable against all opposition, whatever the extent or novelty of our discoveries or improvements in our systems.

The first great merit of Linnæus consisted in the sound philosophy on which he framed his genera. This invention of generic characters, though not his own, was brought to such a degree of perfection by him, and was rendered current by his instrumentality to such an extent, that he is entitled to the high praise of having made it useful to the world. Before his time, natural history consisted of a multitude of particulars spread over so large a surface, that it was impossible to embrace them without devoting a whole life to the subject. By the simple invention of generic terms, the mind is enabled to comprehend and speak of all these particulars in an abridged form. That is done by one word, which before required a hundred. It may safely be asserted, that the application of this metaphysical instrument, familiar as it now appears, has facilitated the acquisition of the knowledge of nature more than any thing besides. It is to the intellect what the steam-engine is to mechanics — a highly compressed form of power, enabling us to do in a minute, and with infinitely less fatigue, what before consumed an hour.

Systematic terms, of a generic character, are now become so common, that naturalists seem to have forgotten the great importance which is attached to them. The subject, of which they formed a part, engrossed nearly all the learning of the latter part of the seventeenth century. It engaged the attention of Locke, Leibnitz, Descartes, and, more or less, of all the master-minds of the age. Hume pronounces the discovery of the real nature of these abstractions to be the greatest and most important which has been made in modern times in the republic of letters. These philosophers treated the subject metaphysically; Linnæus showed its application to practice.

It is very true that the English, who have a metaphysical turn peculiar to northern latitudes, and were among the first to adopt this prodigious concentration of intellectual strength, have, in dwelling upon the engine itself, thrown away some time in a less profitable application of it; yet this is better than the abuse of it by some of our more southern neighbours, who are frittering away the power, by breaking down and dividing substantial genera, until they have almost reduced them to particulars again. Sound philosophy, on the contrary, requires, that, as our knowledge of particulars increases, the generalisation of them should increase also.

This is the proper business of the present generation. Our forefathers have laboured to accumulate the particulars of natural history, until they are become so redundant as to be beyond the grasp of human thought. The only mode by which they can be reduced within our power, is the just application of the laws of generalisation, by persons standing pre-eminent in science, and entitled to prescribe to inferior minds. It is a small and paltry ambition which has inflamed the ordinary naturalists of the present day, that they should wish to impose their own names; that they should be mortified to find themselves forestalled in their barbarous compounds; and that their boast should be in the number of these spurious offspring that may be affiliated upon them.

Besides the placing of genera on a philosophic foundation, we are indebted to Linnæus for the invention of a language of such precise import as almost to supersede the necessity of a draughtsman; and also for the application of trivial names, which is but another mode of generalising.

Whoever will look into the old authors, will see what a wonderful facility is given to the acquirement and communication of knowledge by this simple contrivance. For instance, Ray, in writing or speaking to his friend Willoughby, to tell him he had found *A*ntirrhinum *E*latine (the former being the generic, and the latter the trivial name), is obliged to go round to his point in this manner: — " I have found that *Linaria Elatine dicta folio acuminato;*" and Haller, who was one of the neatest and most skilful definers, if he had communicated the same information, would have employed this periphrasis: — " I have gathered the *Antirrhinum foliis imis conjugatis, superioribus alternis, ad basin hamatis.*"

But the knowledge of the instrument, however requisite, is not the knowledge of the subject to which it is applied. Nomenclature is not the end, but the means, of our study; and if I have offered an excuse for the attention which has been paid to it in this country, I rejoice in any circumstance which is likely to enlarge the boundaries of science, and throw open still wider the temple of nature. The establishment of a Magazine of Natural History cannot fail to promote this object.

Without disparaging other pursuits, the subject has some advantages of a wider bearing than is generally acknowledged.

In the first place, it is admirably adapted to develope and strengthen the faculties of the mind; and this it does, not only by the system and order which are necessary to be observed, but by appealing to some of the higher powers with which we are endowed. Mankind are evidently divided into two great classes, those who particularise (composing the bulk), and those who generalise. No man was ever great, without possessing both faculties in an eminent degree; yet the greater part pass through life without ever discovering that they have this power of abridging and condensing thought by an operation of the mind alone. Even those who do possess the faculty to some extent, are apt to suffer it to run so wild, and to deal in such loose generalities, that they lose half its benefits. Nothing is more likely to develope this peculiarity of the intellect, or to keep it within legitimate bounds, than the systematic study of nature. She furnishes such an infinity of subjects, that no man could grasp the ten-thousandth part who should attempt to become acquainted with all the individuals, and he would be left immeasurably behind another who should employ generic and family distinctions. Nor can the student of natural history make a step in generalisation without a frequent recurrence to his particulars. He would soon find himself lost amidst the mazes of similar and related things, if he were not to examine and reexamine the individuals before him. Unlike many of the subjects of the present day, which seem to owe their attraction to the almost licentiousness of their generalisation, this subject brings with it its own corrective; and to be a good naturalist, requires that the student should be a diligent observer of particulars, as well as a correct generaliser of them.

Another great inducement to adopt the study of natural history, is, that it is admirably suited to correct the tendency there is in our popular institutions to run into schemes of utility. Our mechanics, mathematics, amusements, politics, charities, are all tainted, more or less, with this defect. "The age of chivalry is gone; that of sophisters, calculators, and economists has succeeded." Now, besides this perpetual appeal to utility and reason, as the only, or chief foundation of happiness, there is another and higher appeal, felt by all, and occasionally bowed to by all, which goes to the heart and to the affections; more subtle in its nature, and less within control, there are a thousand cases which yield to no other tribunal, and where man acts with greater safety, trusting to the dictates of his heart, than if he relied upon utility and reason.

To bring the subject home more practically: our scheme of popular education attempts to improve man's moral condition almost entirely through the medium of his understanding. It seems to be adapted to make good artizans, skilful mechanics, industrious tradesmen; but it may be fairly doubted, whether it be suited, in a like degree, to cherish the higher virtues, and to make men better as well as wiser.

I wish to see natural history cultivated as a means of enlarging this contracted view of education, of opening to the little sentient new objects for his affections and sympathies, of awakening within his bosom a love for nature and nature's productions. It is the fashion with a cold and heartless portion of the world, to stigmatise these notions with the names of romance and sentiment. It might, perhaps, be happier for England, not forgetting Scotland, if the sinews of our strength were not wholly exhausted in our industry; if steam-engines, and power-looms, and economy, and profit, divided our attention only, — things which reason approves, but which the imagination forbids. They have a tendency to lower the standard of excellence to their own level, while the repudiated and now antiquated scheme of bettering men through the heart, always proposes a higher and nobler standard than he can reach.

I should, for instance, propose, that the peasantry of England should be improved by being taught that the kitchen-garden does not comprehend the whole scope of horticulture; that there are such things as violets and roses to awaken sweet recollections; ranunculuses and anemones to ravish the eye; and some one or other particular flower, which every man of imagination associates with tenderness and friendship. In passing along through the country, every man's garden may furnish a clue to his character, much better and safer, in our esteem, to trust to, than either physiognomy, phrenology, or autography. Do we see the kail bed of large and ample dimensions, encroaching upon every inch of cultivated soil, we pronounce the possessor to be a political economist, or radical, or voluptuary; on the other hand, if we witness flowers of all hues adorning the vicinity of his habitation, we know there is a spark of his better nature yet unextinguished. It unfolds to us the current of his thoughts and feelings; it tells, like the other also, of honesty and industry; but it tells, besides, of generosity and charity, love and fidelity, of brave sons and beautiful daughters.

I lately was made acquainted with a rustic of this latter class, whose house botanists are wont to frequent for the beauty of the surrounding scenery, and the rare plants to be found in the neighbourhood, a house that Isaac Walton might have delighted in. One of the last acts of this honest vintner's life, was to call his daughter to his pillow, when he said, "Mary, it is a fine morning; go and see if *Scílla vérna* is come in flower." May the virtues of the father descend upon his children! Then may botanists continue to find at this humble inn *, cleanliness and civility, a trowel to dig up their plants, and even a vasculum to secure them. J. E. B.

April 7. 1828.

Art. II. *Observations on the Causes that have retarded the Progress of Natural History in this Country, and on the defective State of our Public Museums. The first of a Series of Essays, intended to comprise a succinct View of the System of* Baron Cuvier, *as contained in his* Règne Animal, *and of his* Researches on Fossil Bones. By B.

There is no country that has the same facilities for procuring objects of natural history from every region of the globe as Great Britain; there is no country where larger sums of money have been expended to purchase them; and yet there is no country in the civilised world, where there are fewer facilities offered to the student of natural history than in England.

The truth of this remark cannot be denied. The two causes which have mainly contributed to impede the study of

* The Running Horse, at Mickleham.

natural history in England may be briefly stated: the first is, the deplorably ineffective state of our public museums; the second is, the very expensive form in which works on natural history are generally published in this country. The total amount of the money expended in collecting objects of natural history for the British Museum, is, perhaps, one hundred times greater than the sum expended in forming the museum of natural history at the Jardin des Plantes, at Paris; and yet the utility of the latter, to the student of natural history, may be fairly said to exceed that of the former, in the ratio of a thousand to one. The British Museum is the property of the nation, having been bequeathed to the public, or purchased and supported with the public money; but, till recently, the public had great difficulty in obtaining access within its walls; and when it was at length opened on certain days, the admission was rather granted as a favour, than conceded as a right. The value of the admission to the student of natural history was greatly diminished from the want of a scientific arrangement of the objects; particularly in the zoological department. The defects were those of its original formation. The intention appears to have been to collect whatever was extraordinary or rare, without any view to arrangement: it was an assemblage of curiosities, some of which, as single objects, were highly interesting to the professed naturalist, but conveyed little instruction to the learner.

After the Greville collection had been purchased by the nation, at a considerable price, a part of the minerals were arranged and exhibited; and the mineralogical department, as far as regards simple minerals, is, perhaps, as well classed as the space allowed for it would admit of. Yet, as a useful collection, it is still defective. Many of the specimens are without labels, and they consist chiefly of the more rare crystallisations of each species, whereas to be really useful, a public collection ought to contain specimens of each mineral, in the most common form in which it usually occurs, as well as the rare crystalline forms, which are only to be found in particular situations.

It is more than twelve years since I was induced to expect that a scientific arrangement of the shells would be undertaken; but after visiting the museum for ten years, I could perceive no progress made in such a labour, and I discontinued my visits, as there appeared every probability that the present generation would pass away before it was accomplished. There were, indeed, some cases, with shells placed to amuse the spectator by the splendour of their colours, or the beauty of their forms; but there was no systematic arrangement of them, nor were the shells labelled or described. This is the more to be regretted, as conchology has risen into importance, from its connection with geology. How different is the museum at the Jardin des Plantes at Paris, where each genus and species of shell is arranged and numbered according to a received system; and the student has only to examine the collection with his book in his hand, to render himself master of the science, as far as books and specimens can teach him! This defect in the department of conchology in the British Museum is to be lamented, as I know of no public collection in this country, from which the student can derive any assistance. Surely the curators of the British Museum, who superintend this department, would do well to recollect the maxim of Hippocrates, "Ars longa, vita brevis."

It has been too long supposed that the nation had nothing to do with the British Museum, but to furnish funds for its support. I hope, however, that the present liberal and enlightened president of the Royal Society, whose zeal for the promotion of science is well known, will feel that he is in trust for the benefit of the nation, and that he will make all the resources of the British Museum more available for the purpose of public information, than they have yet been. It is particularly desirable, as the London University will speedily be opened, that the collections in every department of natural history in the British Museum, should be well arranged, and scientific catalogues published at a reasonable price. If this were effected, it would be of greater benefit to the students than the establishment of lectureships on natural history in the university, as those who had a real desire to learn, would be able to instruct themselves as at Paris.

In offering these remarks, I can sincerely affirm that they are not dictated by any feeling of hostility, but by an ardent desire to see the scientific institutions of our own country rendered as respectable and efficient as those in various parts of Europe; and I am certain, that if they are not so at present, it is neither from want of talent or ability, but arises from a kind of national reluctance to disturb the slumbers of ancient establishments by innovation, even where innovation would be attended with the most favourable results.

The Ashmolean museum at Oxford offers an excellent illustration of what ancient museums were intended to be. Their founders never contemplated the formation of scientific arrangements of natural objects for the purpose of study; but they collected whatever was strange, curious, or rare in nature or art, to surprise or amuse the spectators. In doing so they are entitled to our gratitude, as they preserved many things that were valuable and interesting, which would probably have been lost or destroyed, had they been scattered over the country in the possession of private individuals. I by no means wish that such collections should not be preserved, but the present advanced state of science requires, nay, imperiously demands, something more; and it is much to be regretted, that in London we have no well arranged public collections of objects in the different departments of natural history, that can materially assist the researches of the student.*

The second cause which has greatly impeded the study of natural history, namely, the expensive publications on the subject, might be easily remedied, if the public taste would give encouragement to books in a cheaper form. I am no enemy to splendid editions, and superb plates: noblemen and opulent individuals do well to encourage the arts as well as the sciences; but I see no reason why persons of moderate fortune should not be able to procure books on natural history, at a reasonable price, in this country, as well as in France. In the latter country one of the most perfect systems of zoology, *Le Règne Animal, distribué d'après son Organisation*; or, *The Animal Kingdom, arranged according to its Organisation*, by Baron Cuvier, may be purchased for about twenty shillings. This work, which contains a most luminous arrangement of the whole animal kingdom separated into four grand divisions, is intended as a text-book for the student, and is replete with more scientific information, than any work in our own language published at five times the price. I have long regretted that Cuvier's system, and also his interesting discoveries respecting fossil bones, should be so little known to the English reader; and, therefore, it is my intention to supply this information by a series of essays in succeeding Numbers of this Magazine. The classification of Cuvier is founded on the organisation of animals, and what he denominates "the conditions of existence; or, the immutable laws prescribed to living beings by their Creator." By making his system more generally known, I am persuaded that I shall render an acceptable service to the English reader. B.

March, 1828.

* By public collections, I mean those to which the public have access. There are valuable collections belonging to particular societies and individuals, of which you will probably give some account in your Magazine.

Art. III. *Account of the Habits of a Specimen of the* Símia *Jácchus*, Lin., *or Jácchus vulgàris*, Geoff., *now in the Possession of Gavin Milroy, Esq. Edinburgh.* Communicated by P. Neill, Esq. M.A. F.R.S.E. Sec. W. S.

The living specimen of Símia Jácchus (*fig.* 1.), Oüistiti, or, as it is called by the English in South America, Mamozeet Monkey, which has been in my possession since last June, I procured from a slave in the streets of Bahia (the capital of the province of San Salvador in Brazil), to which place this and many other kinds of animals are brought from the country for sale. At first it was exceedingly fierce and wild, screeching most vehemently when any one dared to approach it. I was about to sail for England, and took it with me on board of our vessel immediately. I laid in a few oranges, bananas, mangoes, and Indian corn, to feed it with during the voyage. A little kennel or box was made, where it slept, or retired when frightened. It was long before it was so reconciled, even to those who fed it, as to allow the slightest liberty in the way of touching or patting its body; and it was almost impossible to do this by surprise, or by the most quiet and cautious approach, as the monkey was not steady a moment, but was constantly turning its head round from side to side, eyeing every person with the most suspicious and angry look; its sense of hearing appeared to be excessively acute, so that the slightest whisper was sure to arouse it. The voice of this little animal was peculiarly sharp and disagreeable, consisting of a very quick succession of harsh and shrill sounds (imitated in the name *oüistiti*), so loud, that they might be heard from the remotest part of the ship.

To give a long description of the external appearance of the animal is quite unnecessary, as the present specimen corresponds in every particular with the descriptions of naturalists, and agrees very well with those I have seen preserved in museums. It is the smallest, I believe, of the Símia tribe, its body not being quite so large as that of a squirrel; the prevailing colour is a lightish brown, edged with grey; the hair on the head and tail is considerably darker, and the latter is very beautifully barred with circular bands of a lighter hue; but what is characteristic of this species is, the cluster or patch of white elongated hairs which stand out before the ears, and give a curious appearance of antiquity to the little animal; so much so, indeed, that it received the appellation of "the little old man" from the sailors. The external ears are peculiarlylarge and capacious, but are nearly hid in the long hair; the size of the concha, no doubt, contributes to the acuteness of its hearing. For a considerable time there was no evident change in its habits, as it continued to be nearly as wild as when I first got it, and showed none of the playfulness and vivacity which characterise most of the monkey tribe.

As long as the fruit which he had on board lasted, it would eat nothing else; but when these failed, we soon discovered a most agreeable substitute, which it appeared to relish above every thing. By chance we observed it devouring a large cockroach which it had caught, running along the deck of the vessel; and from this time to nearly the end of the voyage, a space of four or five weeks, it fed almost exclusively on these insects, and contributed most effectually to rid the vessel of them. It frequently eat a score of the largest kind, which are 2 or $2\frac{1}{2}$ in. long, and a very great number of the smaller ones, three or four times in the course of the day. It was quite amusing to see it at its meal. When he had got hold of one of the large cockroaches, he held it in his fore paws, and then invariably nipped the head off first; he then pulled out the viscera and cast them aside, and devoured the rest of the body, rejecting the dry elytra and wings, and also the legs of the insect, which are covered with short stiff bristles. The small cockroaches he eat without such fastidious nicety. In addition to these, we gave him milk, sugar, raisins, and crumbs of bread. Hitherto the weather was warm, the thermometer being never below 65° or 60° Fahr.; but as we reached a more northern latitude, and approached England, the change of temperature affected the monkey very sensibly; his appetite failed very considerably, and now he would not even touch the cockroaches when given to him; the hair, especially that on the tail, fell off; and, at the end of the voyage, this organ was almost quite bare and naked. He kept constantly in the kennel, rolling himself up in a piece of flannel, which had been put in for warmth, except when he could reach a sunny part of the deck, where he might bask in the heat. There was a considerable continuance of cold north-easterly winds, the thermometer as low as from 42° to 36°


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Fahr., and, as the monkey eat little or nothing, and was quite inactive, I hardly expected to have kept it alive.

When I got it on shore, I kept it for some days in a warm room; it gradually recovered its nimbleness, running about the room, and dragging its kennel after it. Even then it would not eat any insects, and its food consisted of milk and crumbs of bread; it was particularly fond of any sweet preserve, as jelly, &c., and of fresh ripe fruits. From London I brought it with me to Edinburgh last November, and have kept it here till now. During all this time it has thriven perfectly well; it is considerably plumper than it was, and the tail is now completely covered with long darkish hair.

I observe in Linnæus's description of this animal, he says it is a great enemy to cats; so far, however, is this from being the case with the present one, that it feeds and sleeps with puss, and they live on the best terms imaginable.

Though now it is much tamer than it was, it is by no means tractable or docile; it will allow itself to be patted or gently stroked, but all attempts to handle or play with it are quite unsuccessful. When teased or enraged, it exhibits a most ludicrous physiognomy of passion; the white hairs or whiskers on its cheeks are erected; it grins and shows its teeth; it dilates its nostrils, and the little eyes beam with the most passionate fury: it only wants the power of speech to embody its feelings, to represent most faithfully a true picture of anger. Though it does not possess any of that imitative playfulness which is so amusing in many of the *Sı́miæ*, there is a something, an air of intelligence, a look of observation, which we search for in vain in those animals lower in the zoological scale.

Art. IV. *Notice of the Habits of a Mangouste, kept alive at Canaan Cottage, near Edinburgh.* By Alex. J. Adie, Jun. Esq.

The Mangouste, *Vivérra Múngo* Lin. (*fig.* 2.), which has been in my possession for about twelve months, is one of a family of four which were taken on board at Madras. This was the only one that reached England, the other three having died during the voyage. It has as yet borne the rigours of our northern latitude well, but it is a little subject to a cough in cold damp weather. The animal is a female, now between two and three years old. It measures in length 2 ft. including the tail, which is 1 ft. Its colour, when viewed at a little distance, is a silvery grey; but a closer inspection shows that each hair, which is long and coarse, is composed of bars of black, brown, and white, exactly resembling the

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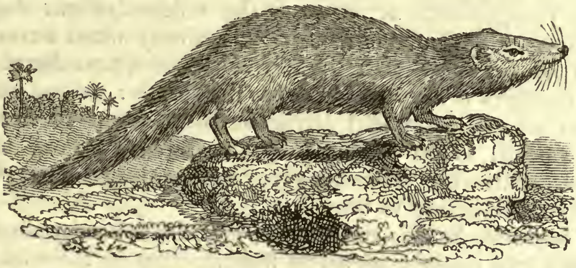

quills of a porcupine. The head is small and very handsome; the legs are strong, the fore ones much tapered, having five separate toes on each foot; the tail is very long, thick at the root, and tapering to a point.

It uses its fore paws with much dexterity; pulls every thing into the cage that comes within their sphere of action, takes insects out of water with them, and when a snuffbox is presented to it, by the rapidity of their motion, expels much of the contents before the box can be shut. It does not take its prey with the claws, but they prove powerful weapons in tormenting it when caught, by throwing it from one place to another. The tail seems to assist the animal in leaping and turning, as in doing so it frequently strikes it against hard objects with such force as to cause it to bleed at the extremity.

Its curiosity is unbounded. When let loose in a room it traverses it at a light, airy, and graceful pace, its feet scarcely appearing to touch the floor; it searches every corner, and kills all insects that are to be found. After the floor has undergone a minute examination, the chairs and tables follow next; these it easily reaches, being able to leap three feet from the ground, and sometimes the pockets of those present undergo the same scrutiny. The mangouste knows the house and garden of Canaan Cottage so well, that it runs about from the one to the other, but never goes away, and appears at the call of those it knows. Myself and another are the only persons it has complete confidence in; it distinguishes my foot at a great distance and runs to me: its powers in this way are very acute. I have seen it set its hair on end and growl when a strange dog was some yards from it, the one being within and the other without the house; with the dog that belongs to the house, it has been on terms of friendship ever since the first interview, when, after giving him a bite on the face, a good understanding was established, and since that time the dog has sometimes used it very roughly without the mangouste resenting it. Should a stranger take hold of it when out of the house it bites and runs off.

The mangouste is as docile as the mildest of our dogs, if you except the time of feeding, particularly when devouring a bird that has been given to it alive. At this time the change in its manners is as quick as it is remarkable: in one second it loses all the mild and attractive dispositions of the pet; these vanish, to be replaced by the repulsive ones of the fiercest carnivorous animals, growling, uttering a sharp bark, and even attempting to bite.

Its favourite food is small birds, and the dexterity shown in climbing into bushes, seems to indicate that in the wild state they may probably constitute a considerable portion of its food. If a mouse, rat, lizard, or frog be given it, before killing it will play with the animal for a quarter of an hour: indeed I do not remember having allowed this to be carried on so long as it might have been disposed; and to put an end to it, the rescue of the victim has only to be attempted, when its death is instantaneous. With a small bird, however, the treatment is very different, for the mangouste has only to see one, when capture and death will follow in a second. If, however, we except the time of feeding, the harshest usage from those it knows will only make it utter a low, plaintive, and murmuring cry. It cries in the same way when hungry, or when wishing to get out of its cage.

Its playfulness is very remarkable; it is more playful than a kitten, with strength and agility superior to that of a cat. It is impossible to describe the numerous positions it twists its body into; perhaps the most marked of them is that of standing on the hind legs and leaping like a kangaroo.

As it is mentioned in various books on natural history, that the mangouste can dive, swim, and remain long under water, like the otter, for the purpose of taking fish; in order to try if this one possessed the same faculty, I put an egg into a large basin of water, and showed it to the mangouste; immediately the animal dived its body up to the shoulders and took out the egg. A few minnows were then put into a small basin; it took them with great ease and avidity; but it could not take them out of a larger basin, the water seeming to deprive it of sight, as soon as its head was plunged under the surface; it preferred to watch till they came to the edge, and pounce on them; but these attempts proving as abortive as the first it abandoned them altogether. Since that time several birds have been put into a small pond, but the mangouste would not go into the water for them.

March, 1828. A. J. Adie.

Art. V. *Some Remarks on the Habits of the Kingfisher.* By S. T. P. of Leeds.

It has been justly observed by an accomplished naturalist, that there are few facts, however isolated, however trivial they may respectively appear, more conducive to the illustration of the history of animals, than those which relate to their habits. I am induced, therefore, to send for insertion, in any Number of your forthcoming Magazine of Natural History, some particulars relating to the habits of the kingfisher (*Al*cèdo I'spida, (*fig.* 3.) which I do not find mentioned in any English ornithological work. Indeed, the editor of the last edition of *Pennant's British Zoology* says, "the kingfisher seldom flies much, or far from its haunt," but the facts I am about to state bear a different aspect.

Early in the month of October last, while passing a short time on our southern coast, and within half a mile of the sea, I was agreeably surprised by the sudden appearance of great numbers of kingfishers, in a country where I had previously observed only an occasional example. On enquiry, I found that these birds regularly make their appearance on that coast in October, and as regularly depart in the following spring. Of this, the occurrences of last month furnished some proof. A collector of birds for London preservers sent notice that the kingfishers had returned to the banks of the Thames, in his neighbourhood, and in one week he furnished eighteen specimens, the production of his own gun, though they are well known to be one of the most difficult birds to shoot.

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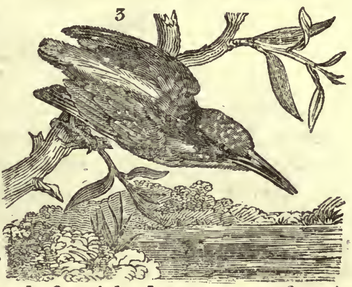

These birds lay six or seven eggs, nearly round, tinged with a most delicate pink colour, from the influence of the yolk pervading the transparent albumen and thin shell; they have, moreover, a much larger air-bag (folliculus aëris), than is to be found in any other British bird's egg, in proportion to its size. It is well known that the eggs of birds, deposited in their nests on the ground, contain a larger quantity of air in the receptacle, than those placed in nests upon trees; and the young of the former are invariably produced in a much more perfect state (supposed to be owing to the influence of the greater portion of oxygen), than the young of the latter, which remain helpless and naked for several days, while the young of the former are covered with down, and able to quit the nest with part of the shell on their back; a beautiful provision of nature in favour of those which are most assailable by enemies.

Mr. Bewick remarks, that "kingfishers are not so numerous as might be expected from the number of eggs found in their nests; owing, probably, to the young being destroyed by floods, which must often rise above the level of the holes where they are bred." Whether the still greater quantity of air assists in rendering the young kingfishers at their birth more competent to encounter this additional risk, I am unable to state. The departure of these birds to the coast, on the approach of cold weather, may be accounted for on the supposition, that instinct has taught them that they are less likely to be deprived of their food, by the effects of diminished temperature, near large bodies of salt water: but some of your readers may probably suggest other reasons and better.

March 18. 1828. S. T. P.

Art. VI. *Fanciful Ideas for a National Museum of Shells.* By Conchilla.

Sir,

As your Magazine seems to embrace every branch of natural history, I venture to lay before you the plan of a national museum of shells, so contrived as to have a high metaphysical relation to society in general. That shells are capable of as much I will endeavour to show; and in order to prepare myself at least a serious hearing, I beg you to reflect upon the importance which, at different times, has, by all nations, been attached to shells. How can any man despise a shell, when he reflects how many heroes of old were not only content to quaff nectareous draughts in shells in honour of their mistresses, but also to pour from them libations to the gods themselves? How many of the poets also "tune the vocal shell?" And more than all, the classic scholar will find, that even the most gallant of the ancients allowed Venus herself nothing more than a shell for a car. I have been led particularly into these reflections from a tour which I lately made through Holland. During my progress it was my good fortune to visit Scheveningen, the little sea-port of the Hague, where I employed the greater part of the day very agreeably in the examination of a cabinet of shells. These were certainly neither rare nor arranged in a very scientific manner; but there was altogether a novelty in their disposition which exceedingly delighted me. They were neither strewed upon tables, labelled in glass cases, nor arranged in the drawers of a cabinet; but so disposed as to form statues of men and women, some of them as large as life. But as the ancient feast (I think it was Philopœmen's), notwithstanding the great variety of dishes it contained, was still nothing but hog; so these, notwithstanding the variety of forms in which they appeared, were all the while nothing more than Dutch.

I would have mine a gallery applicable to all men, since I would have these characters familiar to them all. The eloquent man of genius should be formed from shells of the Phòlas (*phōleō*, to seek a hiding place; habitat) kind (*fig.* 4. *a a a*),

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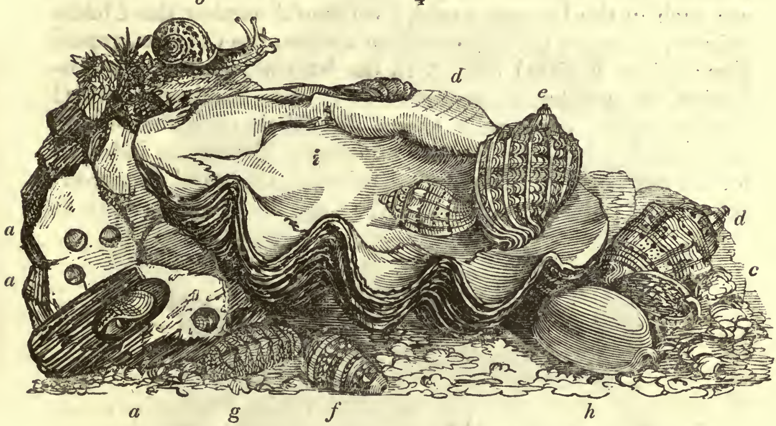

a a a, Phòlas.	*f*, Cònus ammiràlis.
b, Hèlix.	*g*, Chìton.
c, Cypræ̀a arábica.	*h*, Cypræ̀a Auròra.
d, Volùta mùsica,	*i*, Chàma gìgas.
e, Volùta hárpa.	

since we are told that that little animal, with its tongue alone, is found to penetrate even into the hearts of rocks themselves; it is found also to contain an illuminating property that darkness cannot resist: and are not these characteristic of true eloquence and true genius? Perhaps to form such a character I might be found borrowing also from the Hèlix (*heileō*, to twist round; shell spiral, or with circumvolutions of the whorls) tribe (*fig.* 4. *b*); for, notwithstanding all that the horticulturist may advance to his disadvantage, I confess that I, who am little of a botanist, can never see a snail in my path without feeling for him sentiments of more than ordinary respect and consideration. When I behold his telescopic eye, I always think of a man of science; and when I see the dignity with which he supports the whole weight of a house of which he is himself the architect, I cannot, in my own mind, help giving him a much higher place in the scale of animals than any naturalist has yet assigned him. Besides these, we conchologists have otherwise, for the adornment of the learned and accomplished, our Cypræ̀a (*Cypris*, one of the names of Venus) arábica (*fig.* 4. *c*); our musics, Volùta (*voluta*, a volute; form) mùsica (the surface resembling musical scores) (*fig.* 4. *dd*); our harps, Volùta hárpa (ribs like the strings of the harp) (*fig.* 4. *e*); and our Cònus (*kōnos*, a cone; form) ammiràlis (*fig.* 4. *f*); while, for the designation of rising merit, we can offer the cradle-formed Chìton (*chitōn*, a coat of mail; loricated appearance) (*fig.* 4. *g*), and the Cypræ̀a Auròra. (*fig.* 4. *h.*) For the depiction of the profoundly heavy, and the heavily profound, (for you know, Mr. Editor, there are such in the literary world,) we would employ the Chàma (*chaino*, to gape; though only one species, the *C.* gìgas, gapes) gìgas (*gigas*, a giant) (*fig.* 4. *i*), the heaviest shell in our possession, its weight being often six or seven hundred pounds! The plagiarist, or he who erects the fabric of his fame with scraps stolen from the labours of others, should be indebted for his garments to the Sabélla (*sabulum*, fine sand or gravel; constituent parts of the shell) tribe (*fig.* 5. *a*), whose shell, as

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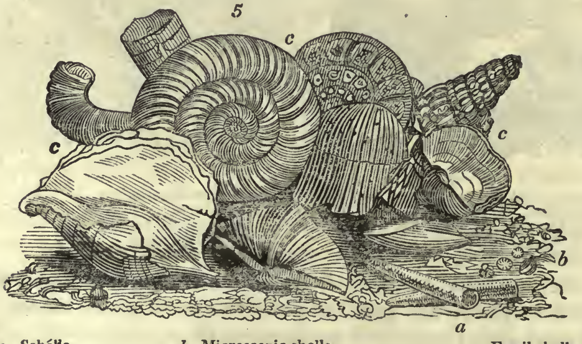
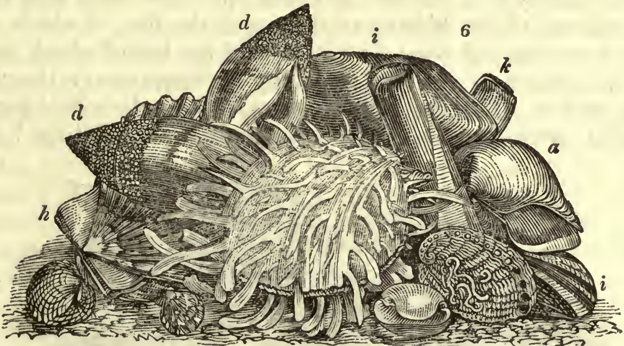


a, Sabélla. *b*, Microscopic shells. *c c c*, Fossil shells.

naturalists inform us, is entirely composed of fragments formerly belonging to various other kinds. It is to be regretted that the dextrous hermit, Cáncer Bernárdus (*St. Bernard*, of Menthon, the benevolent founder of the Alpine monasteries of Great and Little St. Bernard), of whom we are told by honest Isaac Walton, has no shell of his own, otherwise it might well aid in the representation of him, who, though prone and forward to assert, is deficient in argument, and therefore has recourse to that of others, in order to defend himself; for, as we are informed by the above-mentioned author, whenever this curious animal is attacked, he always leaps into another shell, and in that way defends himself. Minute philosophers, such as those who have spent much time and pains in teaching mankind how a bee's leg is jointed, or what species of circulation is carried on in the viscera of that little animal which inhabits a fly's head, &c. &c., I would designate by microscopic shells (*fig.* 5. *b*); while my fossil ones (*fig.* 5. *c c c*) should be laid apart for the adornment of the antiquary and the geologist, to whom we are indebted for them. Thus much for the learned: but for the would-be-so, who wish to be mistaken for them, there is the *M*ỳa (*myō*, to compress; form of shell), or gaper (*fig.* 6. *a*); the Búlla (*bulla*, a



a, Mỳa.
b, Búlla.
c, O'strea obsolèta.
d d, Volùta aúris Mìdæ.
e, Haliòtis.
f, Sérpulæ.
g, Spóndylus.
h, Scállop.
i i, Muscle.
k, Sòlen.
l, Cockle.

bubble; swelled round form), or bubble (*fig.* 6. *b*); the O'strea (*ostrea*, an oyster) obsolèta (*fig.* 6. *c c*); the O'strea obscùra; and though last, not least, the ears of Midas, Volùta aúris Mìd*æ* (resemblance of shell to an elongated ear). (*fig.* 6. *d d.*) For the depiction of the spendthrift we have the Haliòtis (*hals*, the sea, *ōta*, ears; earlike form) tribe (*fig.* 6. *e*), whose favourite employment appears to be to make holes in its own house, and what other is his? The toadeater, the boon companion, or, to use his more classical denomination, the parasite, who so often lives upon the generosity or prodigality of this latter character, could not, I think, be better delineated than by the Sérpulæ (*serpulla*, a serpent; form) (*fig.* 6. *f*), who fix themselves and their shells so firmly upon those of larger and more powerful Testàcea (*testaceus*, having a shell), that no effort of these latter can shake them off; so there they live in peace, plenty, and security, of a duration coeval to their benefactor. The robes of the testy should be made of the shells of the Spóndylus (*spondylos*, the prickly head of an artichoke; form), or thorny oyster (*fig.* 6. *g*), which seems to present a prickle every way; while those of the scallop (*fig.* 6. *h*), the muscle (*fig.* 6. *i i*), the Sòlen (*sōlēn*, a tube; resemblance, when the shells are closed), or razor-sheath (*fig.* 6. *k*), and the cockle (*fig.* 6. *l*), might very well denote those persons whom one meets with in society every day, and who are so tremblingly alive to little matters which regard precedence and respect: for naturalists inform us that the scallop, which moves on whichever side it likes, by a species of jerk, ought to be considered as of a higher rank than the muscle, which moves slowly in a groove; but that this latter must also take precedence of the Sòlen and the cockle, the first of which can only move up and down in a hole, and the last of which, having no motion of its own, can only go wheresoever the tide may waft it. For the glutton we can boast the whole genus Patélla (*patella*, a little dish; shape of the shell) (*fig.* 7. *a*),

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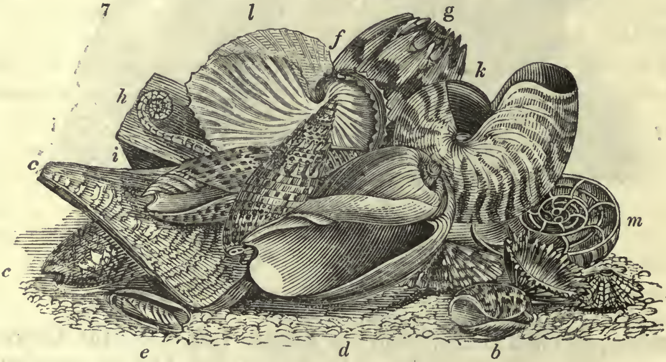

a, Patélla.
b, Búlla ampúlla.
c, Sea Hams.
d, Melon.
e e, Olives.
f, Papal Crown.
g, Persian crown.
h, Lítuus.
i, Mìtra episcopàlis.
k, Naútilus.
l, Argonaúta.
m, Section of the *Naútilus.*

and the Búlla ampúlla (*ampulla*, a bottle) (*fig.* 7. *b*); besides sea hams (*fig.* 7. *c*), melons (*fig.* 7. *d*), olives (*fig.* 7. *e e*), &c. &c. And it will increase your admiration of our riches in the world of shells, to find that we have yet in store crowns, both papal (*fig.* 7. *f*) and Persian (*fig.* 7. *g*) for the ambitious; and for church dignitaries the Lítuus (*fig.* 7. *h*), or crozier, and the Mìtra episcopàlis. (*fig.* 7. *i*.) The Naútilus (*naus*, a ship; floats on the surface of the sea) (*fig.* 7. *k*) and Argonaúta (*argonautēs*, the companions of Jason, in the celebrated ship Argo, were so called) (*fig.* 7. *l*) have an obvious reference to heroes of the main; the former, besides that, should serve me for another portraiture, virtue nobly struggling with mis-fortune. The shell of this interesting creature is, as we are informed, exceedingly thin and fragile, and divided into as many as forty chambers or compartments (*fig.* 7. *m*), through every one of which a portion of its body passes, connected, as it were, by a thread. Thus situated, it has many enemies; and among others the *T*ròchus (*trochus*, a boy's top; resemblance in some of the species) (*fig.* 8. *a*) who makes war upon it with unrelenting fury. Pursued by this cruel foe, it ascends to the top of the water, spreads its little sail to catch the flying breeze, and rowing with all its might, scuds along, like a galley in miniature, and, by the exertion of its nautical talents, endeavours to escape its more cumbrous pursuer. Sometimes, however, all will not do, the *T*ròchus nears and nears, and escape appears impossible; but then the little animal, with inexplicable ingenuity, suddenly and secretly extricates itself from its tortuous and fragile dwelling, and which, when the *T*ròchus perceives, he immediately turns to other prey. The *N*aútilus then returns to tenant and repair its little bark; but it too often happens that before it can regain it, it is by a species of shipwreck dashed to pieces on the shore. Thus wretchedly situated, this hero of the testaceous tribe seeks some obscure corner "where to die," but which, nevertheless, seldom, if ever, happens, until after he has made extraordinary efforts to establish himself anew.

Some shells, and among them some of the most beautiful, have an outward covering or veil called an epidermis (*fig.* 8. *a b c d*), and of these would I select largely for the portraiture which I should be inclined to give of female excellence; for this puts me in mind of the veil of modesty, through which every charm comes doubled to the beholder's eye.

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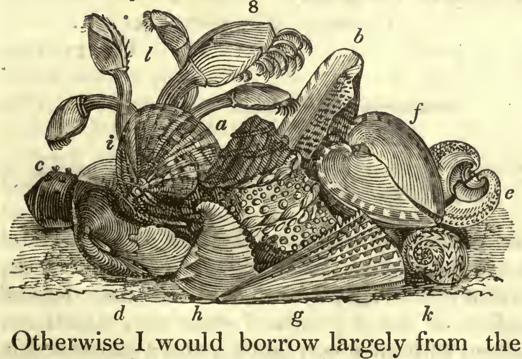


a, Tròchus.
b c d, Veiled shells.
e f, Cockles.
g, *P*ínna frágilis.
h, Carinària vítrea.
i, Vènus Chìone.
k, *N*erìta canrèna.
l, *L*èpas anatífera.

Otherwise I would borrow largely from the genus Cárdium (*kardia*, the heart; form). (*fig.* 8. *e f.*) I hope my fair countrywomen will forgive me for finding nothing better for the occasion than the heart-shaped cockle (*fig.* 8. *f*); but, in truth, I have chosen it on account of its being more heart than any thing else; as truly I would rather, of the two, have them lovable than wise. I hope I shall also be forgiven, if I mingle with it the *P*ínna (*pinna*, a wing or feather; shape) frágilis (*fig.* 8. *g*), to put the world in mind of the unlovableness of an amazon. To come to particulars: for a boddice I would employ the Carinària (*carina*, a keel; form) vítrea (*fig.* 8. *h*), the glassy *N*aútilus, a most rare and valuable shell, entirely pure and transparent, and by which I would have understood that the qualities of the heart are the most valuable; and that of these purity and sincerity are among the foremost. The head I would adorn with the Vènu*s* (the sea-born goddess) islándica (*fig.* 8. *d*), and Vènu*s* Chìon*e* (*Chione*, the daughter of Dædalion, of whom Apollo and Mercury became enamoured) (*fig.* 8. *i*) which, besides its uncommon beauty, contains an animal capable of assuming a variety of forms at pleasure: and is not this a good shadowing of the wisdom of her who can turn her talents to whatever fate may have rendered the most necessary and pleasing in her? Enchanted with this the last of my creations, as a proof of my affection I will add a belt of the *N*erìta (*neros*, hollow; the superior whorls occupying but a small portion of the internal cavity) canrèna (*fig.* 8. *k*), and take my leave; not, I fear, before you have in your own mind likened this shell of my thoughts to the *L*èpas (*lepas*, a rock; adhering to rocks) anatífera (*anas*, a goose, *fero*, to bear; feather-like tentacula gave rise to the whimsical supposition of the barnacle shell being the parent of the barnacle goose) (*fig.* 8. *l*), in which, Sir Robert Moray informs us, he could always find something of the goose.

I remain, Sir, yours, &c.

Hampstead, March, 1828. CONCHILLA.

Art. VII. *A general Introductory View of the Jussieuean or Natural System of Plants.*

The difficulties connected with the adoption of the natural system of plants are these, that the characters of many of the orders are at present imperfectly known, and that they depend upon a consideration of many points of structure, which are not to be determined without much labour, and a considerable degree of practical skill in the use of the microscope and the dissecting knife. But the facilities which the habit of viewing all natural bodies with reference to the relations they bear to other bodies, and not as insulated individuals merely possessing certain peculiarities by which they may be referred to some station in an artificial system, ultimately gives to the investigations of the naturalist, are so great, that difficulties of the nature just alluded to ought not to be suffered to influence the botanist in determining which line of study he will follow, whether that pointed out by Linnæus, or that traced by the hand of nature. By the artificial system of Linnæus, indeed, no great difficulty exists in determining the number of stamens or styles possessed by a given plant, or the nature of their combination, and, from the knowledge so obtained, in referring them to their class and order in the Linnean system. But when this step has been gained, what more has been acquired than the bare knowledge that the plant in question possesses a certain number of stamens and styles? No possible notion can be formed of the relation it bears to other plants of the same nature, of the qualities it probably possesses, of the structure of those parts not under examination, — the fruit, for example: and, finally, if it were wished to convey an idea of the plant to a stranger, no means of doing so would be in the possession of the Linnean botanist, except by stating that the plant belongs to Pentándria Monogýnia, for example; which is stating nothing. But what would be the condition of the student of the natural affinities of plants in a similar case? It is true he would be obliged to consult more characters than the two uninfluential ones of Linnæus: it would be necessary to ascertain whether his subject is vascular or cellular; if vascular, whether it is monocotyledonous or dicotyledonous; if dicotyledonous, whether the leaves are opposite or alternate, stipulate or exstipulate, whether the flowers are monopetalous, polypetalous, or apetalous, the nature and station of the stamens, the condition of the ovarium, and so on. But when he has ascertained thus much, only let it be remembered for a moment how much he has gained indirectly as well as directly. Perhaps he has discovered that his plant belongs to *R*ubiàceæ; he will then have learned that all vegetables with opposite entire stipulate leaves, and a monopetalous superior corolla are also rubiaceous; if a fragment of the leaves and stem only of such a plant were afterwards submitted to him for examination, he would recognise its affinities, and remember that it was rubiaceous, and, being aware of that fact, he would be able safely to infer that its calyx and corolla would be of a particular nature; that if the roots afforded any colour for dyeing it would be red; that the medicinal properties of the bark, if any, would be tonic, astringent and febrifugal; and that its seeds would be of the same nature as those of coffee; and, finally, its geographical position would be tolerably certain to him.

The really important obstacle which exists in the way of acquiring this kind of knowledge is undoubtedly the want of any introduction to the study of it, accompanied by the distribution and characters of the natural orders into which plants are divided. It is to be hoped that English readers at least will not long have to regret this deficiency in their elementary works. In this place it must suffice to point out the characters upon which the great divisions depend, under which the orders themselves are arranged; and it is to be hoped that even this small aid will be found to smooth the way, and to remove some of the obstacles that at present are supposed to exist at the very threshold of the temple.

Plants, considered with reference to their general structure, are separated into two grand divisions, called CELLULA`RES and VASCULA`RES.

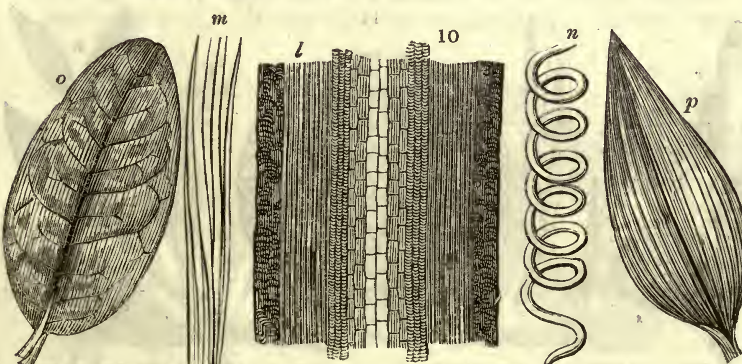
The Cellulàres answer to the Linnean Cryptogàmia, and are also called Acotyledonous; the Vasculàres answer to the rest of the Linnean system, which is sometimes called Phanerogàmia and Cotyledonous.

CELLULA`RES, CRYPTOGAMOUS, or ACOTYLEDONOUS plants, are all, therefore, different terms, denoting the same combination of vegetables. The first term is here adopted in preference to the others, as expressing the most obvious character upon which the division depends, namely, the cellular, not vascular, structure of the plants composing it. Cellular plants

a, Longitudinal section of a stem.
b, Transverse section of a stem.
c, Stem of a moss, with leaves and thèca, or seed-case.
d, Leaf of a moss, magnified.
e, Leafy thállus of a lichen, with shields.
f, Crustaceous thállus of a lichen, with shields.
g, *Fúngi* of the highest dignity.
h i, *Fúngi* of the lowest rank.
k, Conferva magnified.

are formed entirely of cellular tissue (*fig.* 9.), without woody fibre or spiral vessels; or, in more familiar terms, by their having no veins in their leaves if foliaceous, and not forming wood; they are also destitute of perfect flowers. The lower tribes, such as *F*úngi and *A*'lgæ, are destitute of leaves, and in some points approach the animal kingdom so nearly as to be scarcely distinguishable from it. In the highest tribe, *F*ílices, apparent veins are formed in the leaves; but, as they are imperfectly supplied with spiral vessels, they cannot be considered more than analogous to the veins of other plants. Ferns, however, hold the intermediate station between Cellulàres and Vasculàres, and are chiefly retained among the former, on account of their perfect accordance in other respects. In the whole of Acotylédones it is unnecessary to examine the seed for the purpose of determining whether it has one cotyledon, several cotyledons, or none, the structure of the perfect plant giving the most obvious and satisfactory evidence.

VASCULA`RES, PHANEROGAMOUS, or COTYLEDONOUS plants are also separated into two great classes, called Endógenes or Monocotylédones, and Exógenes or Dicotylédones, both which are distinguished as accurately by their obvious physical structure as they are by the minute and obscure peculiarities of the seed. They are all formed with cellular tissue, woody fibre, and spiral vessels (*fig.* 10.), and their leaves are traversed by veins; the last character is sufficient for practical purposes, if it is remembered that they also bear perfect flowers, (that is, flowers furnished either with stamina or pistilla, or both,) which always prevent their being confounded with the highest tribes of Cellulàres.



l, Vertical section of a vascular stem.
m, Woody fibre.
n, Spiral vessel.

o, Leaf of a dicotyledonous plant.
p, Leaf of a monocotyledonous plant.

Endógenes, or *Monocotyledonous* plants, are the first remove from Cellulàres, and hold an intermediate rank between them and *Exógenes* or *Dicotyledonous* plants, in which vegetation acquires its highest form of developement. They were formerly characterised by having a single cotyledon, but this circumstance is not only not absolute, but difficult of determination, except after minute analysis. The real difference between their seed and that of Dicotylédones is this, that in Monocotylédones there is only one cotyledon (*fig.* 11. *s*), or, if two, that they are alternate with each other (*fig.*11. *t*), while in Dicotylédones they are always opposite, and more than one, sometimes several, as in *P*ìnus. (*fig.* 12. *y.*) The physiological structure of the two classes is, however, that by which they are familiarly distinguished, and exhibits a beautiful proof of the harmony that exists between the great features of vegetation and their first principle, the seed from which they originate. In Endógenes or Monocotylédones there is no distinction between wood and bark (*fig.* 11. *q*); in Exógenes or Dicotylédones, the wood and bark are distinctly separated. (*fig.* 12. *v.*) In Monocotylédones the wood and cellular tissue are mixed together, without any distinct annual layers of the former being evident; in Dicotylédones the wood and cellular tissue have each their particular limits assigned them, a distinct layer of the former being annually deposited. In Monocotylédones there are no radiations from the medulla to the bark; in Dicotylédones the radiations are distinctly marked. In Monocotylédones there is generally no articulation between the leaves and the stem, while in Dicotylédones the leaves are always jointed with the stem from which they fall off, leaving a scar behind. In Monocotylédones the veins of the leaf pass in parallel lines

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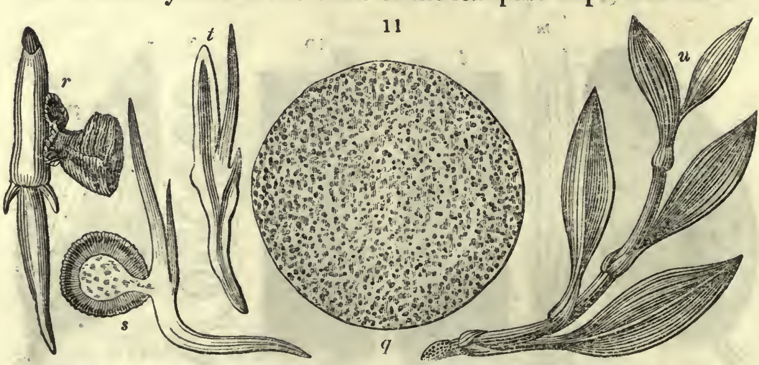

q, Transverse section of a monocotyledonous stem.
r, Germination of a monocotyledonous seed.
s, Section of ditto, to show the cotyledon remaining in the testa.
t, Section of a germinating embryo of a grass, to show the two alternate cotyledons of unequal size; the back and front lobe represent these, the middle lobe is the plumula
u, Stem and leaves of a monocotyledonous plant.

from the base to the apex, in Dicotylédones they diverge from the midrib towards the margin at various angles; in the former they are branchless, the principal veins being connected by nearly simple secondary veins; in the latter they are much branched, ramifying in many directions, and giving the surface of the leaf a netted appearance.

Such are the very obvious distinctions of the two great classes of Phanerogamous, or flowering plants; and so far is it from there being any necessity for dissecting a seed in order to ascertain its structure, that this point is one of the most easy determination, and about which there cannot be in one case in five hundred the slightest cause of doubt or difficulty. It is almost impossible to take even a morsel of a plant in the hand without instantly being in possession of the knowledge of the structure of its seed, with respect to the cotyledons.

Thus far have we advanced without a single obstacle to impede us. In all farther investigation no greater degree of knowledge or application is requisite, than what ought to be possessed by every one who would be able to ascertain the genus of a plant. Many of the orders do not depend upon the minute characters of the seed so much as is believed; the structure of the ovarium and position of the ovula are aids which frequently make amends for the absence of fruit: and the nature of the foliage and inflorescence are guides which, though sometimes treacherous, are often as faithful as the fructification itself. But as it is not intended to give the characters of the orders in this place, neither is it necessary to advance farther in an explanation of the manner of determining them; upon that point each order would require a particular note. It may however be confidently believed that

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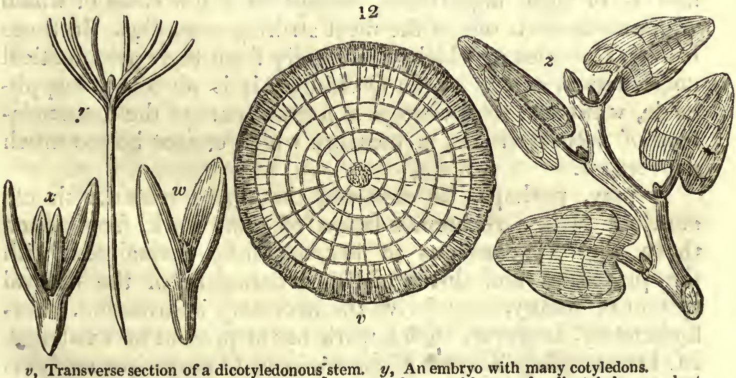

v, Transverse section of a dicotyledonous stem.
w, An embryo with two cotyledons.
x, An embryo with four cotyledons.
y, An embryo with many cotyledons.
z, Stem and leaves of a dicotyledonous plant.

there are no greater impediments in the road to an acquaintance with the natural relations of plants than those which have been already removed; and that, although neither the science of botany, nor any other science, is to be taken by storm, yet the fortress is sure to be reduced by silent and patient approach.

It only remains to explain briefly the principles upon which the names of the orders, sub-orders, &c., are formed. It is usual, in the school of Jussieu, to give to a natural order a name derived from that of the genus which is understood to be the type of the order, — as *R*anunculàceæ from *R*anúnculus, *R*osàceæ from *R*òsa, and so on: but several deviations from this principle were admitted by Jussieu, in favour of certain groups of plants, long known by other popular names derived from certain peculiarities; such as Labiàtæ, because their corollas are labiate; Compósitæ, because their flowers are what is commonly called compound; Guttíferæ, on account of the resinous juice in which they abound; and some others. It would, perhaps, have been better if uniformity in nomenclature had not thus been sacrificed to a dread of innovation; but it is now too late to remedy the evil, if such it is; nor would the advantage of alteration be at this day equivalent to the inconvenience. For the purpose of making it at once apparent whether, in speaking of a group of plants, reference is had to an order or a sub-order, it has of late years been thought convenient to terminate the name of the natural order in *aceæ*, and that of the sub-order in *eæ*: thus, in speaking of the whole mass of which *R*anúnculus is the representative, the word *R*anuncul*àceæ* is used; but in speaking of the particular division or sub-order of which *R*anúnculus forms a part, the term *R*anuncùl*eæ* is employed. This manner of speaking is, however, at present very partial in its application; and is of little importance, except in a few cases of which *R*anunculàceæ is one of the most striking examples. In those orders, the titles of which, necessarily from their grammatical construction, end in *eæ*, as Orchídeæ, it is obviously inapplicable, without a total change in a great part of the nomenclature of natural orders, a measure which cannot be too much deprecated.

It may, perhaps, be expected that these remarks should conclude with a recommendation of some work, from which those who are anxious to become fully acquainted with the principles and distinguishing characters of the natural system of botany, may derive the necessary information. Unfortunately, however, such a work has at present no existence. M. Decandolle's *Théorie E'lémentaire de la Botanique* explains the principles upon which the orders of plants are constituted, and M. de Jussieu's *Genera Plantarum* contains their characters as determined in 1789: but the latter is now too obsolete to be very useful to the tyro. In our own language the only work that can be consulted upon the subject with advantage is the *Flòra Scótica* of Professor Hooker, in which the characters of the natural orders of Scottish plants are concisely indicated by Mr. Lindley.

[The foregoing forms a part of the introduction to our *Encyclopædia of Plants*, Part II., Natural System. In our next Number we shall proceed to give a general view of the divisions and subdivisions of vegetables according to this system, in doing which we shall give figures of all the principal genera, and more especially of those species which are of most usual occurrence in Britain, in order to render this superior mode of studying botany as easily and universally understood as possible.]

(*To be continued.*)

Art. VIII. *The principal Forest Trees of Europe, considered as Elements of Landscape.* By J. G. Strutt.

There is no defect so common in painted or engraved landscapes, as the want of distinctive character in the representations of trees. With the exception of Constable, Nasmyth, Robson, Strutt, and a few others, most artists appear to content themselves with producing variations of a few general and vague forms of masses of foliage, trunks, branches, and spray: it seems to be enough for them to produce a tree, without attempting to represent any particular species; or considering that to give a true idea of nature, the spectator ought to be able to distinguish the sort of tree in the picture, with the same facility with which he distinguishes it in the reality. Why trees should not be represented with the same truth and fidelity as animals, buildings, or other objects, there can be no good reason assigned; and the only way of accounting for it is, by the general residence of landscape painters in cities, and the very little attention paid by most of them to natural history as a science. Were this study to enter into the education of the landscape painter, as much as that of general history enters into that of the historical painter, we should not so frequently have to regret, in the works of our first artists, not only violations of truth and nature in the kinds of trees, but in their situations in regard to soil, surface, water, and other trees or plants. A little knowledge of botany would prevent artists from putting spring and autumnal plants in flower or fruit in the same picture, placing the plants of woods and shady places in open sunshine, and committing a number of similar violations of nature. The combined knowledge of indigenous zoology, geology, and botany, ought to be considered as essential to the landscape painter as it is to the cultivator. It is one object of our Magazine to direct public attention to this subject; and we are happy in having procured the assistance of Mr. Strutt for the tree department. Every reader, who is acquainted with the admirable engravings in this gentleman's *Sýlva Británnica* and *Delíciæ Sylvàrum*, will know what to expect from so eminent an artist.

The botanical characters of the trees, which will follow Mr. Strutt's pictorial descriptions, will be given chiefly for the sake of beginners in botany; and to show to artists, self-practising amateurs, as well as professional men, the detailed forms of the leaves, flowers, and smaller parts. To insure the accuracy of these botanical details, they will be looked over by Mr. George Don, too well known as a scientific botanist to require any eulogium here. — *Cond.*

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No. I. — The Oak.

It is a beautiful notion of St. Pierre's, and one which has the advantage of being safe from any positive contradiction, that the earth, on its first assumption of form and laws, appeared clothed, with respect to the vegetable creation, not only in the verdure which has been well styled " her universal robe," but also with trees in every stage of their existence; an idea which Milton has also given us in his exquisite description of the creation: —

> ——" Last
> Rose, as in dance, the stately trees, and spread
> Their branches, hung with copious fruit, or gemm'd
> With blossoms; with high woods the hills were crown'd,
> With tufts the valleys, and each fountain side;
> With borders long the rivers: that earth now
> Seem'd like to Heav'n, a seat where gods might dwell,
> Or wander with delight, and love to haunt
> Her sacred shades."

Leaving, however, for the present, the dryads and hamadryads of such enchanting precincts to the poets who have so well embodied their existence, we shall turn our attention to " the stately trees," and endeavour to ascertain, and to point out, to such of our readers as may be desirous to acquire some knowledge of their varieties and character, with reference to their appearance and effect in landscape, the most striking peculiarities in each species, and the mode best adapted for their delineation. In the course of this disquisition, we shall have occasion to present to the young student in painting, a variety of sketches illustrative of our propositions, given, not from the recorded treasures of the brain, but from a more inexhaustible storehouse; being acquired by diligent study in the living academies of nature,—the groves and the forests of our native country. And here it may be well observed, that no set of rules or examples, drawn from other men's labours, will be sufficient to form an original landscape painter: we can only put the proper implements into the hands of the student, form in him a habit of accurate perception, and introduce him to the objects best adapted for his pencil: it is for him to find his own path for the future, and penetrate into the solitudes and the recesses of the forest, where every thing will be congenial to his pursuit, and where he will not have to complain in the elegant language of Quintilian, — " Quare silvarum amœnitas, et præterlabentia flumina, et inspirantes ramis arborum auræ, volucrumque cantus et ipsa latè circumspiciendi libertas, ad se trahunt; ut mihi remittere potius voluptas ista videatur cogitationem, quam intendere." " Wherefore the sweet tranquillity of the woods, 'the liquid lapse of murmuring streams,' the soft whisperings of the summer air amid the boughs, the melodies of birds, and the unrestrained freedom that the eye enjoys, all attract the mind to themselves, so that these delights appear to me rather to interrupt than to promote our meditations."

European trees may, by the painter, be divided into four classes: the round-topped, as the oak, chestnut, elm, willow, ash, beech, &c.; the spiry-topped, as the different species of the fir tribe; the shaggy-topped, comprehending those of the pine; and the slender-formed, as the Lombardy poplar and the cypress. In the first of these classes, foremost in dignity and grandeur, the oak stands pre-eminent, and like the lion among beasts, is the undoubted lord of the forest. Beauty, united with strength, characterises all its parts. The leaves, elegant in their outline, are strongly ribbed, and firmly attached to the spray, which, although slim and excursive, is yet bold and determined in its angles, whilst the abrupt and tortuous irregularity of its massive branches, admirably contrasts with the general richness and density of its clustered foliage. Even as a sapling, in its slender gracefulness, it exhibits sufficient firmness and indications of vigour, to predicate the future monarch of the wood; a state, indeed, which it is slow to assume, but which it retains *per sæcula longa*; and when, at length, it is brought to acknowledge the influence of time, and becomes "bald with dry antiquity," no other production of the forest can be admitted as its rival in majestic and venerable decay. The general form of the oak is expansive, luxuriant, and spreading. Its character, both with respect to its whole, and to its larger masses of foliage, is best expressed by the pencil in bold and roundish lines, whether as single trees (*fig.* 13.), as groups (*fig.* 14.), or as forming the line of a distant forest (*figs.* 15, 16.): although when growing more closely together, they assume a loftier and less spreading appearance than the more solitary tree, such as Mason has so beautifully described in his *Caractacus*,—

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——"Behold yon oak,
How stern he frowns, and, with his broad brown arms,
Chills the pale plain beneath him."

The sketches (*figs.* 14, 15, 16.), to which we have just alluded, will more distinctly exemplify our position, exhibiting, in the distinct distances, the same general appearance in the contour of the trees.

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But whilst, as an entire object, these curved lines are sufficient to express the general peculiarity of its outline, as well as the larger masses of its foliage, when we come to examine the oak more closely, and in detail, we find that a greater variety of line must be adopted to display its singular proportions, so indicative of energy and boldness. The trunk and limbs (*fig.* 17.) are characterised by their amazing strength,

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and by their comparative shortness and crookedness; and the branches by their numerous contortions and abrupt angles, and by the great variety which they exhibit of straight and of crooked lines, and by their frequent tendency to a horizontal direction: these striking peculiarities are exemplified in the accompanying sketch. (*fig.* 17.)

Not unfrequently, however, the forms of the limbs and branches are entirely concealed by the exuberancy of foliage, as is the case in the Bounds-Park oak, and more particularly in that magnificent living canopy,—*nulli penetrabilis astro*, impervious to the day,—(fully described in the *Sýlva Británnica*), the Chandos oak at Southgate, which, although not exactly a painter's tree, is unquestionably unrivalled for regular beauty and plenitude of shade. The oak, also, is occasionally found to present an extremely graceful and pleasing figure, as is remarkably the case with the celebrated oak at Lord Cowper's, of which we subjoin a drawing. (*fig.* 18.) This tree, above a century ago, was well known as the great oak at Panshanger.

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There is also a beautiful tree, represented in the first of these sketches (*fig.* 13.), of the same description, at Lord Darnley's seat at Cobham, which, being protected from the depredations of cattle, enjoys the most perfect freedom of growth, extending "its latitude of boughs" in every direction, and drooping its clustered foliage to the very ground.

(*To be continued.*)

PART II.

REVIEWS.

Art. I. *Some Account of the Work now publishing by M. Audubon, entitled The Birds of America.* By William Swainson, Esq. F.R.S. F.L.S. &c.

Dear Sir,

I drew up the enclosed notice of M. Audubon's publication, with the intention of sending it to you anonymously; but justice to its author, and a wish of assisting your infant Magazine, has since induced me to become the avowed writer. If, therefore, you desire it, you are at full liberty to use my name. This avowal may possibly have some weight with those, who may be tempted to think that praise has descended into flattery; and who are not aware that I have long aimed at that perfection, which M. Audubon has so fully attained.

I am, dear sir,
Your faithful obedient servant,
W. Swainson.

Tittenhanger-Green.
April 11. 1828.

In nothing is the inconsistency of mankind more striking than in their treatment of genius. In every generation arises one or two spirits, who seem destined to attain a marked preeminence in what they undertake; and to contradict the axiom, that knowledge advances by slow and imperceptible steps. Absorbed in the accomplishment of their object, or devoted to their particular study, they become blind to all considerations of a mere worldly nature. The advantages of interest, the acquirement of wealth, even the comforts of social life, are by such men despised or set at nought, if opposed to the ruling passion of their minds. To attain this, they will struggle against difficulties, apparently insurmountable, against discouragements innumerable, and against poverty itself. Yet how do the world receive such spirits? Let the page of history answer. In every age, however enlightened, and in every kingdom, however great, innumerable are the melancholy examples of its coldness, ingratitude, or apathy. Historians, philosophers, poets, painters, naturalists—have shared the same fate; have been neglected while living, and have sunk to the grave in obscurity or want. Yet no sooner are they placed beyond the joys or the sorrows of this world, than men's minds undergo a sudden change; they discover exalted merit in what was before ordinary talent; they lament over "departed genius," follow its poor remains, perhaps ostentatiously, to the grave, recite eulogiums on the departed, and finally erect a splendid monument over his ashes—a memorial of unavailing honours to the dead, and of silent reproach to the living.

Such has been the usual fate of genius, in every age and in every country. The observation may be trite; but, like many other things, we require to have it forced on our recollections. That there are great and striking exceptions, where genius, during life, has been appreciated and rewarded, is a gratifying fact. The more so, as it goes far to account for its frequent neglect, when living. Mankind, in general, are prone to acknowledge merit when it becomes strikingly conspicuous: more particularly in matters that are within the comprehension of the many; or where it concerns the comforts, amusements, or interests of the whole community. The safety-lamp immediately raised its discoverer to eminence: and the perfecting of the steam-engine secured wealth and honour to him who achieved it. But where genius is employed on pursuits of a less popular nature, pursuits which belong solely to our intellectual gratification, it is less perceived, for its merits can be known to few. Even among these, it has not unfrequently to contend against party feeling, personal envy, or secret jealousy. In matters of taste, the great bulk of mankind, not having the power to judge for themselves, rely on the opinion of those few who can point out what is excellent. They may be often, indeed, misled by such guides; but the public, in the end, generally arrive at a just conclusion. If once their attention is awakened to unquestionable merit, they are seldom backward in acknowledging and rewarding it. To awaken this attention, however, is the great difficulty. So many are the candidates, and so numerous are their claims, that, unless a writer has the influence of the press, or the patronage of the booksellers, he has but little chance of success. Besides, people in general are so taken up with their own immediate pursuits, that they can seldom afford attention to other matters, unless they are actually brought before them.

I must confess that such has been my case with the work I am to notice. I never saw it announced in the booksellers' lists, exhibited in the London print-shops, or lauded in the

Literary Gazette; neither did its prospectus swell the bulk of the *Quarterly*. A short notice of the first number in a scientific journal * excited no particular interest in my mind; and, but for other circumstances, it is probable I should have known as little about it, as the public seem to do at this moment.

Nevertheless, I had heard enough of the author, to excite the greatest interest in his history. M. Audubon, if I have been rightly informed, is a citizen of America, descended from French parents. Devotedly attached to the study of nature, no less than to painting, he seems to have pursued both with a genius and an ardour, of which, in their united effects, there is no parallel. His two ornithological narratives, printed in one of the Scotch journals, are as valuable to the scientific world as they are delightful to the general reader; they give us a rich foretaste of what we may hope and expect from such a man. There is a freshness and an originality about these essays, which can only be compared to the animated biographies of Wilson. Both these men contemplated Nature as she really is, not as she is represented in books: they sought her in her sanctuaries. The shore, the mountain, and the forest were alternately their study, and there they drank the pure stream of knowledge at its fountain-head. The observations of such men are the corner stones of every attempt to discover the natural system. Their writings will be consulted when our favourite theories shall have passed into oblivion. Ardently, therefore, do I hope, that M. Audubon will alternately become the historian and the painter of his favourite objects; that he will never be made a convert to any system, but instruct and delight us as a true and unprejudiced biographer of Nature.

I am now to speak of M. Audubon more particularly as a painter. I shall, therefore, view the work before me as a specimen of the fine arts, and judge it by those rules which constitute pictorial criticism. The size of the plates, exceeds any thing of the kind I have either seen or heard of; they are no less than 3 ft. 3 in. long, by 2 ft. 2 in. broad! On this vast surface every bird is represented in its full dimensions. Large as is the paper, it is sometimes (as in the male wild turkey, pl. 1.) barely sufficient for the purpose. In other cases it enables the painter to group his figures, in the most beautiful and varied attitudes, on the trees or plants they frequent. Some are feeding, others darting, pursuing, or capturing their prey; all have life and animation. The plants, fruit, and flowers which enrich the scene, are alone still. These latter,

* Zoological Journal, No. xi. p. 469.

from their critical accuracy, are as valuable to the botanist as the birds are to the ornithologist. The early plates are executed by Lizars, the latter ones by the Havells, in an open, free style, well adapted for colouring. This latter process is, in most instances, performed faithfully; but a little more attention on the part of the colourer, in copying the exact tint, would be desirable.

Such is the general character of the work, but it is of a nature to demand a more particular notice. What I have said might, in a general way, be repeated of others. This, as I shall presently show, is perfectly unique, both in its conception and execution. To explain this, I call the reader's attention to the following plates, or rather pictures: —

The female Wild Turkey and her Young. (Pl. 6.) — The immense size of the principal figure (which will barely come within the paper) has obviously fettered the artist in his choice of attitude. If not graceful, it is nevertheless easy and natural, while the details are perfectly accurate. But the great merit of the picture lies in the brood of young ones, collected round the mother, and variously employed. Some are picking the

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leaves of plants, others looking about for insects (*fig.* 19.), one is trimming its tail, and all are busy. The grouping of these little creatures cannot be surpassed; it would do honour to the pencil of Rubens. The pencilling is such a perfect copy of nature, that, although the attitudes are difficult, and perhaps uncommon, we fancy we have seen them over and over again. A little one in the fore-ground, immediately under its mother, is particularly fine: it has laid itself on its side, and raised one of its wings to catch a small A'carus or harvest bug not yet lodged within the feathers; the head of this, and of another pecking at a lady-bird, are admirable specimens of foreshortening. I wish the plants had been engraved in a different style from the other subjects,—they are too coarse; but the etching of the infant progeny does great credit to Mr. Lizars's talents.

Purple Grakles. (Pl. 7. upright.) — As a composition this is my chief favourite. The size of the birds and of the plant has enabled the painter to group both in large and imposing masses. The grakles are called, in America, maize-thieves, from their destroying the Indian corn. Two of these birds are here represented " in the fact:" one is clinging to an ear of maize, from which it has extracted its seeds; the other is clearing away the outer husk of a fresh ear, having stripped that on the left of all the best grains. The story is clearly told; and the grouping of the parts so judicious, as to produce a fine effect.

The Bird of Washington, or Great American Sea Eagle. (Pl. 11.) — This noble figure is an upright, and occupies the full size of the paper. It is standing in repose on a rock, and nothing is introduced to take off from the simplicity of the design, or the grandeur of the bird. If the passions of the brute creation can be traced in their physiology, (and no doubt they can,) we can discern as much of the mild dignity of the great American patriot, in this his emblem, as can well be expressed in the head of a bird.

Baltimore Orioles. (Pl. 12.) — This is a sweet and harmonious group. These gaily coloured birds, of a black and orange-coloured plumage, have suspended their pensile nest among the foliage of a tulip tree, whose broad leaves and delicate flowers form an excellent contrast to the other colours. The clinging of the female to the side of the nest, is most happily expressed: it must have been a study from nature. The upper figure of the male, just putting out his feet to alight, shows a master's hand. This figure I look upon as the " rightful lord " just returned from an absence, during which his mate has been insulted or persecuted by an intruder: against him, but still clinging to her nest, is she defending herself, when her partner comes to the rescue. The figure of this intruder (perhaps designedly) is much inferior to the others.

Great-footed Falcons in the act of devouring Canadian Teal. (Pl. 16.) — A masterly, but by no means a pleasing picture. It is a scene of slaughter and of butchery. I cannot, however, pass over the drawing of the left hand figure, and the inimitable foreshortening of the head (*fig.* 20.) without praise. The leg of the right hand bird seems to me faulty, but I write under correction, never having seen a falcon in this particular attitude. From this I turn with pleasure to

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Turtle-doves of Carolina. (Pl. 17.)—It is quite impossible to treat this subject with greater truth, or delicacy of conception, than it has here received. In a thicket of the beautiful Stuárt*ia* Malacodéndron, (whose white blossoms are emblematic, like the dove, of chasteness and purity,) a pair of turtles have built their nests. The female is sitting, and — their union being consummated — she is receiving the caresses of the male. Above is another pair; their love is in its infancy. The male, seated on the same branch with his intended partner, is eagerly pressing forwards to reach a "stolen kiss," but the head of the female is coyly turned. Her secret satisfaction is, however, expressed by the agitation of her wings and tail. If the artist had never painted any picture but this, it would secure him the highest meed of praise, so long as truth and nature continued the same.

Mocking Birds defending their Nest from a Rattlesnake. (Pl. 21.)—The same poetic sentiment and masterly execution characterises this picture. The formidable reptile has driven the female bird from her eggs, which he intends to suck. Unable to defend them while sitting, she clings to the side; and, "with outstretched wings and forward breast," seems prepared to strike her bill into the very jaws of her enemy. Her cries have brought two others of her race to the spot: but these, not feeling a parent's solicitude, "come not boldly" to the attack. On the courage of the male bird the fate of the conflict seems to depend. He is close to the serpent, aiming a deadly stroke at its eye, while his own is lighted up with a determination and courage, which seem to bespeak anticipated victory. Every part of the story is told with exquisite feeling. The artist has thrown his greatest skill in the figure of the female bird, and it is uncommonly fine.

Purple Martins building their Nest in a Gourd. (Pl. 22.) — M. Audubon seems to delight in attitudes which would set every other ornithological painter at defiance. How inimitable is the foreshortening of the upper left hand figure ! the mouth appears actually open. The female bird, pluming her wing, shows the ease with which his pencil can master the greatest difficulties.

Song Sparrows. (Pl. 25.) — I look on the attitude of the male, as one of the most difficult that can well be imagined. It is a complete front view of a bird, with half-expanded wings, in the act of seizing a spider immediately above its head. The ease and gracefulness of the pencilling are very striking.

Carolina Parrots. (Pl. 26.) — This is a most extraordinary picture. It represents a flock of these birds, busily engaged in devouring the seeds of the cuckle-bur. These parrots must be great favourites with the painter, or he would not have introduced them so profusely; there are no less than seven figures placed in the most varied attitudes, and all the size of life. Although not charged as such, the colouring of this plate must have cost three times the price of the others. Yet a painter would not be wholly pleased with it. Not, indeed, from any defect in the artist, but from the impossibility of keeping down the superabundant vividness of the golden and red heads of these birds. The colours in nature are so brilliant, that they defy all attempts at harmonising.

The last plate I shall dwell upon is, *A Family of Red-headed Woodpeckers.* (Pl. 27.) This is a peculiarly picturesque composition. The ground-work is the decayed trunk of a tree, perforated by insects, in the hollow of which the old birds have reared their young; one of the latter, hearing the arrival of the parents from a foraging party, has emerged half way in the entrance; two others, who seem to have been on the look-out, are eagerly receiving the produce of the chase. The female bird has just returned from a distance with a ripe berry; the male is on the trunk of the tree, holding forward, in his bill, a caterpillar, which one of the young birds is impatient to seize. This happily illustrates the frugivorous and insectivorous food of this species, so different from those of the typical woodpeckers. The figure of the male bird will remind the painter of that *sideshortening* (to coin a new phrase), so common in the pictures of Paul Veronese, and which gives such a graceful turn to many of his best figures.

Many of the excellencies which I have already dwelt upon, will be found in the less imposing subjects; but these need not be enumerated. Nothing in this world can be perfect; and, that my judgment may not be deemed partial, I shall touch on two or three, in which I think the painter has not been equally happy. The lower figure of Pl. 23. has the bill too much inclined upwards for the direction of the head. The form of the bird in Pl. 30. may be natural, but is, to me, thick and displeasing. The colouring of Pl. 15. is harsh and much too vivid; and there is a heaviness in the figure of Pl. 24. which is a solitary exception to my preceding remarks. Were I, however, taxed for further criticisms, I could not increase the list, while they are so insignificant in themselves, as scarcely to deserve notice.

I have heard that M. Audubon resided twenty-five years in the woods of America, devoted to this one pursuit. Without any other testimony than the plates before me, I can well believe the fact. He must have lived with a note-book in his pocket, and a pencil in his hand. Nothing short of such a period, and of such enthusiasm, could have achieved what he has done. The same devotedness to his darling object seems to have brought him to Europe, under the hope of accomplishing what no individual fortune could do, without the support of liberality and wealth; namely, the publication of his works. As yet I feel perfectly convinced that this is done with a heavy and a serious loss to himself. Each of the numbers, of which six have appeared, contain no less than five plates, and are sold at two guineas, being an average of little more than eight shillings each! Let this price be compared with the usual charge for either publications or prints, and it becomes comparatively nothing. I can only wonder at the disregard of the author, for a remuneration even of his own expenses.

So far, therefore, I consider his work as comparatively, one of the cheapest that can be purchased.

I have heard it mentioned, as an objection to the size of the work, that the same object could have been accomplished by bringing the subjects within the usual dimensions of illustrative publications; or what the French happily call *ouvrages de luxe.* This I deny. These plates do not exhibit a uniform " rivulet of margin," with a single bird perched upon the tall leafless trunk of a tree, " signifying nothing," and merely put in to fill the paper. Here every object speaks, either to the senses or to the imagination. The examples I have quoted, show that histories are to be narrated, and peculiarities are to be explained. To trace such things, the painter must have " ample room and verge enough." It is this which elevates the character of his paintings, from mere matter of fact portraits, to historical representations. We feel, in short, that it is M. Audubon alone who can produce a work, which, without such advantages as he possesses, not all the united talents now in existence could supply.

It will depend on the powerful and the wealthy, whether Britain shall have the honour of fostering such a magnificent undertaking. It will be a lasting monument, not only to the memory of its author, but to those who employ their wealth in patronising genius, and in supporting the national credit. If any publication deserves such a distinction, it is surely this; in as much as it exhibits a perfection in the higher attributes of zoological painting, never before attempted. To represent the passions and the feelings of birds, might, until now, have been well deemed chimerical. Rarely, indeed, do we see their outward forms represented with any thing like nature. In my estimation, not more than three painters ever lived who could draw a bird. Of these the lamented Barrabaud, of whom France may be justly proud, was the chief. He has long passed away; but his mantle has, at length, been recovered in the forests of America.

On casting my eyes over the list of subscribers, it is with gratified feelings that I see His Most Gracious Majesty at the head. From the fine and original taste which our king seems intuitively to possess, I question whether any of his subjects are better qualified to appreciate the merits of M. Audubon. The number of nobility who have followed the example of their sovereign, as yet, are few. To the honour of the public bodies and libraries of Edinburgh, and of our own Universities, they all appear to have stepped forward as subscribers; waving their undoubted right (hard as that right is,) to the possession of free copies. It is singular that nearly the whole of the remaining subscribers are provincial, principally from Yorkshire, Liverpool, and Manchester. This, however, may be accounted for, by M. Audubon having visited these parts of England. I conclude that in London his name and his works have not yet come into notice; that they assuredly will, ere long, I have no doubt. There is superabundant wealth, (and the liberality to use it too,) in the metropolis alone, sufficient to insure the continuation of ten such works, could they be found.

I have no personal acquaintance with M. Audubon. I never even saw him. The copy of his work, which furnished these remarks, has been lent to me. These are vouchers for my sincerity and disinterestedness. But I can appreciate genius; and I shall ever employ my poor abilities to make it known. My praise shall be well directed, and I shall then feel assured it will ultimately have weight.

W. S.

Art. II. *Catalogue of Works on Natural History, lately published, with some Notice of those considered the most interesting to British Naturalists.*

Britain.

Wilson, William, Esq. F.R.S.E., Member of the Wernerian Natural History Society: Illustrations of Zoology; being Representations of new, rare, or otherwise remarkable subjects of the Animal Kingdom, drawn and coloured after Nature: with descriptive Letter-press. Blackwood, Edinburgh. Cadell, London. Atlas 4to. Nos. I. II. III. and IV. 16*s*. each.

The object of this magnificent work is to convey coloured representations (whenever possible, of the size of life,) of whatever animals are the most signalised by nature for their scarcity or beauty, or for any extraordinary peculiarities in their form, structure, instinctive habits, particular dispositions, or general economy of life. The plates are accompanied by detailed statements of the generic and specific characters of the animals delineated; and the representation of every separate order, or extensive natural group of the animal kingdom, is preceded by a short introductory essay, in which the general characters of that division are very delightfully explained. This we conceive to be a principal, and very important feature in Mr. Wilson's work, that every species is made to represent and illustrate the history of many others; and thus, in a condensed space, a student, while following out the history of a single species, may acquire an accurate knowledge of the essential relations of an extensive generic group.

Most of our author's materials appear to be drawn from the Edinburgh Museum, a most richly stored zoological collection, of the origin, progress, and present condition of which, we hope, ere long, to provide our readers with a compendious history. The work now under review is intended mainly to illustrate the novelties of that museum; but, at the same time, the author's pages are open to efficient communications from all other quarters. Indeed his principal object seems to be to relieve the science of natural history from the extreme aridity of its accustomed details; and, by combining the precision of a scientific treatise with the more excursive and agreeable character of a popular miscellany, to entice towards the study those who, not being especially called to it by an instinctive and irresistible tendency, are apt to be dismayed by the barren technicalities of science, falsely so called.

Mr. Wilson's work, though expensive, is not high-priced: by which we mean to say, that although the costly nature of the materials employed, renders the publisher's remunerating price considerable, we yet think the charge (16*s.* per number) very moderate. The form is that of atlas quarto; and every number contains four plates, each representing one or more subjects, according to their size; and is accompanied, as we have said, by corresponding letter-press, splendidly printed by Neill, in which the natural history of the animals delineated is amply detailed. The numbers appear at indefinite periods of three or four months, and well merit the patronage of those to whom splendid, and at the same time instructive books, form the finishing furniture of the drawing-room. In subsequent notices we shall present our readers with some characteristic examples of the author's style, and mode of treating his subjects. In the meantime, as the author of these *Illustrations of Zoology* is warmly impressed with a desire to extend the province of the science, and as we ourselves are now venturing to follow in a similar course, with the same object in view, we most heartily wish him success.

Bowdich, Mrs. *T. Edward*, widow of the late celebrated African traveller; a lady of the most amiable disposition and elegant manners, and of great and various acquirements: The Fresh-water Fishes of Great Britain. In imperial 4to Numbers. No. I. Ackermann.

This is a production of no common merit; and we are the more anxious so to announce it, because, from its nature, it can fall into comparatively few hands, and will be seen much less than it deserves. Mrs. Bowdich, the widow of a gentleman whose narrative of the mission to Ashantee has obtained considerable celebrity, has here exhibited remarkable talent in pourtraying the fishes of our rivers and lakes. When it is mentioned that every illustration contained in each copy is separately drawn and painted by this lady, without the aid of the engraver, it will be perceived that she has undertaken a task of no slight magnitude. As the supply of a work, conducted upon such a plan, must necessarily be limited, we understand it is not contemplated to extend it beyond fifty copies, and even to proceed to that extent will call into exercise an unusual degree of perseverance.

In the classification Mrs. Bowdich has been assisted by Baron Cuvier, whose system she has adopted, and who has furnished her with the nomenclature he intends to employ in his forthcoming great work on Ichthyology.

The first and only number yet published, contains drawings of the trout, carp, roach, and bleak. The regular series of the families has been intentionally interrupted in the illustrations, for the sake of variety in each number; those least interesting to the eye being mingled with their more beautiful companions. As specimens of art we can only speak of these drawings, in common, we believe, with all who have viewed them, in terms of admiration. Each painting has been made from the living fish, immediately after it came from the water it inhabited, so that no tint has been lost or deadened, either by changing the quality of that element, or by exposure to the atmosphere. The artist has judiciously selected her subjects, not from extraordinary or large specimens, but from those of a common magnitude, and has chiefly directed her attention to convey the correct shapes of the fishes, and to exhibit the brilliancy of their colours with fidelity. They are, therefore, what they profess to be, strictly portraits; and, as such, are most acceptable to the naturalist.

Curtis, John, Esq. F.L.S.: British Entomology; being Illustrations and Descriptions of the Genera of Insects found in Great Britain and Ireland; containing coloured Figures from Nature of the most rare and beautiful Species, and in many instances of the Plants upon which they are found. London. 8vo. Monthly Numbers, 4s. 6*d.*; vols. 1*l.* 17*s.* 6*d.* each.

This work was commenced in 1824, and the numbers already published exceed four volumes. Though the author limits himself to the illustration of genera, yet, by giving a synoptic view of the species of each genus, his work is rendered exceedingly complete, and highly instructive to beginners. The figures, both of the insects and plants, are beautifully executed, and in each plate are dissections of the smaller parts, more or less magnified, as the case may require. The natural order of each genus is given, with various synonyms, and references both to published works and existing cabinets; the descriptions are in English. The scientific and English names of the plants are also given, and, as the same plant is never repeated, the student may gain from this work a knowledge at once of insects and plants. As we shall very frequently have recourse to the past volumes in the course of our labours, we shall only stop at present to notice the number which has just appeared.

No. LII. for April, contains

207 to 210. — Colymbètes (*kolymbētēs*, a swimmer; habit) consobrìnus (cousin-german; relation to other species); Coleóptera Dyticìdæ. An inhabitant of lakes, ponds, brooks, and rivers, and found throughout the year, but most abundantly from the end of April to July. There are thirty-three British species. The plant on which this figure is shown is the Utriculària vulgàris, Common Utricularia, Bladder Snout, or Hooded Milfoil; Dian. Monog. and Lenticulàriæ. — Coccinélla (dim. of *kokkos*, a berry; resemblance) ocellàta (*ocellus*, a little eye), Little-eyed Lady-bird, Coleóptera Coccinellìdæ. A family of insects which attack and live on the aphides, and keep them within the limits prescribed by Providence. The plant is *A*strágalus glycyphýllos, Liquorice-leaved Astragalus, or Wild Liquorice; Diadélphia Decándria, and Leguminòsæ Papilionàceæ *A*stragalèæ. — Amphìsa Walker*àna*, Walker's Amphisa (*fig.* 21.) Lepidóptera Tortricìdæ. A very rare moth, of which only two individuals have been taken and sent to the author. The plant is Cerástium latifòlium, Broad-leaved Mouse-ear Chickweed; Decandria Pentag., and *C*aryophyllèæ. — Anápheles (*a* intens. *apheles*, slender; form) bifurcàtus, Twice-forked Anapheles (*fig.* 22.); Díptera *C*ulicìdæ. This insect occurs about London, and has the appearance of the gnat in its flight and manner of life, but does not sting. The plant is *A*gáricus plicátilis, Plicate Mushroom. Cryptogàmia *F*úngi *L.*, and Hymenomycètes Hymenìni Pileàti *Fries.* (The cross lines indicate the natural size with the wings expanded.)

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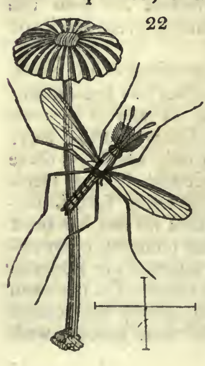
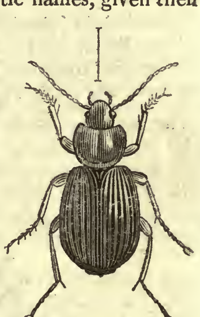


Stephens, James Francis, F.L.S. &c.: Illustrations of British Entomology; or, a Synopsis of Indigenous Insects; containing their Generic and Specific Distinctions, with an Account of their Metamorphoses, Times of Appearance, Localities, Food, and Economy, as far as practicable. Embellished with coloured Figures of the rarer and most interesting Species. London. In 8vo Numbers, monthly. *3s. 6d.* Nos. I. to XII.

This work was commenced in 1827, and twelve numbers are published. The object of the author is "concisely to describe, in systematic order, and with reference to their natural affinities, such species of insects as have hitherto been discovered to inhabit the United Islands of Great Britain and Ireland. To these descriptions — which I trust will be sufficiently explicit to enable the entomologist clearly and satisfactorily to identify any of the insects he possesses, or may hereafter obtain — will be appended such facts, relative to the economy or locality of the respective species, as have either been communicated by others or observed by myself, accompanied with occasional entomological remarks. The average lengths, or the usual expansions, of the several species, are also introduced at the end of the specific characters; and for the purpose of enabling the student readily to obtain, at one view, a knowledge of the contents of any order or inferior section, their more obvious characters are laid down, in a tabular form, at the head of each superior group. Their peculiar distinctions are afterwards detailed in English, drawn out, as far as possible, from external differences; and, unless mentioned to the contrary, the descriptions, &c., are made from, and collated with, specimens in my own collection."

The author seems to have fulfilled his intentions, and we only regret that he and Mr. Curtis have not accented the systematic names, given their derivations, and also the literal English of the specific names, as we have elsewhere recommended. We have only room at present to state, that



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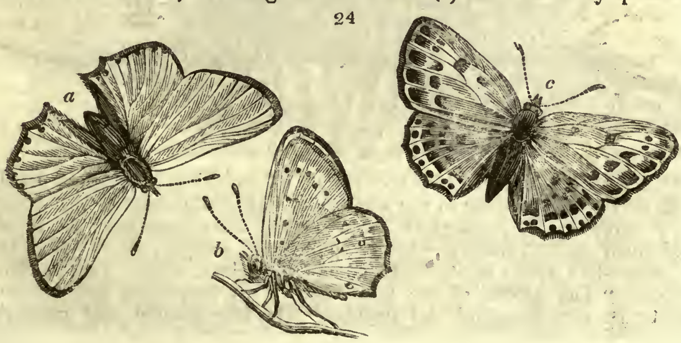
No. XII. for April contains, of Coleóptera, Platýderus (*platys* broad *derē*, a neck) ruficóllis; Coleóptera Harpalìdæ. Not uncommon in the neighbourhood of London. — Argùtor (*argutor*, to make a shrill noise). Eleven species, of which the most uncommon is the A. vernàlis, very abundant near London, inhabiting every gravel-pit and stony lane. — Pogònus (*pōgōn*, a beard). Thirty species, all of which inhabit the sea-side. P. chálceus (*fig.* 23.) is found both on the eastern coasts, and also on the shores of the Thames and Medway. — Pæ′cilus (*poikilos*, spotted). Five species. Of P. virgaúreæ (*fig.* 24.), the male (*a b*) has the wings above of a beautifully resplendent fiery copper colour, the anterior immaculate with a black border; the wings of the female (*c*) are beautifully spotted.

24



It is said to inhabit the marshes in the isle of Ely and Huntingdonshire, and to be found on the flowers of the golden rod at the end of August. Polyómmatus (*polys*, many, *omma*, eye). Six species, none of which are very common.

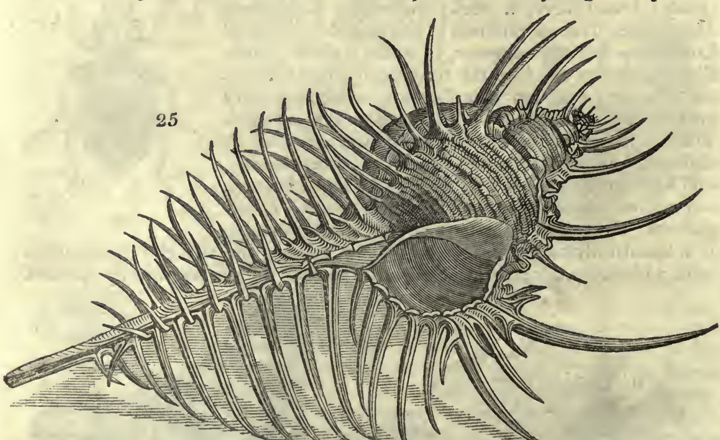
Sowerby, George Brettingham, F.L.S. Collector of objects of Natural History, and general Agent and Salesman in articles of this description, residing at No. 156. Regent Street, London: The Genera of recent and fossil Shells, for the use of Students in Conchology and Geology. With original Plates, drawn and engraved by J. D. C. Sowerby, F.L.S. London. In 8vo Numbers, monthly. 4*s*. plain; 6*s*. highly finished in colours.

Of this very beautiful work thirty numbers have appeared. The nomenclature followed is generally that of Lamarck; but some alterations have been made in the species, and some new genera formed by the author. The species are not arranged according to any system; but, each plate having a distinct page of letter-press, the whole may be methodised, when completed, at the pleasure of the purchaser, or according to the system which may be thought best at the time. In short, by this plan of publishing, which is also that of the botanical periodicals, the plates may undergo, in the course of their duration, as many modifications of arrangement, as the shells themselves in a cabinet. One great advantage of it is, that it never compels the author to figure from a bad specimen, in order to go on regularly with his system; neither is he likely to be so hurried as he otherwise would be, in order to produce the work regularly; and the consequence is, that the execution of the plates in this work, is of the very first order of merit.

No. XXX. for April, contains

Fasciolària (*fasciola*, a winding band; small folds near the base of the columella, or neck,) aurantìaca. Trìto*n* (the sea god; beauty of the shell). Six species from the West Indies and islands of the South Seas. *M*ùrex (*murex*, the point of a rock; resemblance). Three very singular species:

25



M. haustéllum, so named on account of its remarkably elongated canal; *M.* cervicórnu, alluding to the stag's-horn-like protuberances with which it is covered; *M.* phyllópteris, from its leaf-like appendages; *M.* tenuispinòsus (*fig.* 25.), from its slender spines; *M.* scórpio (*fig.* 26.) from the scorpion-like apices of its fronds; and *M.* melanámathos, from its black fronds. "The species of the genus *M*ùrex are numerous, and many of them are very beautiful and singular. The long-pointed and regularly arranged spines on *M*ùrex tenuispinòsus *Sam.* (commonly called Venus's comb) render it an extremely interesting and delicate object. *M.* scórpio is remarkable for the dilated apices of its fronds; *M.* ràdix, for its fine black short spines; *M.* règius, for its brilliant crimson-coloured aperture; *M.* cervicórnu, for the forked points of its larger fronds; *M.* pálma-ròsa, for the delicately tinted tips of its finely toothed fronds; and *M.* haustéllum, for its uncommonly lengthened canal. These are mostly tropical species; but the genus is found in all countries: it is marine, and is naturally furnished with an epidermis, though this is commonly cleaned off before these shells come into the market.

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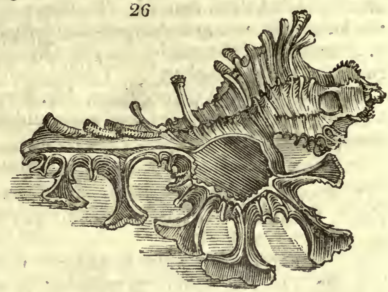

"Of fossil species of *M*ùrex there are also many, generally belonging to the tertiary beds.

"There is a circumstance of unusual interest to be observed in the manner in which the animal increases the size of its shell, and which shows most admirably the regularity and beauty of the laws of nature, and directs the mind to the contemplation of the wisdom and power of the Creator, who alone could teach these little animals how to construct a habitation so perfectly adapted to their circumstances and situation. It will be observed, that each periodical increase of these shells, consists of a piece which surrounds about a third part, or less, of the lower portion of the last volution already formed, which portion is always terminated by a varix, which is more or less muricated and even spinose; it is obvious that these murications or spines must be in the way of the future increase of the shells, unless they could be removed from that part which it is intended to cover; the animal, therefore, is furnished with the means, probably by a solvent liquor, of eating away the lower part of these spines, so that they become detached, and fall off, by the time that he is ready to form his new inner lip upon the space which they occupy, thus forming a comparatively smooth and even surface, on which it is to spread the testaceous matter, of which the addition to his building is composed."

Clausília (*clausus*, closed; from a little elastic shelly bone, whose function appears to be to close up the aperture when the animal has withdrawn itself within the shell); three species. "This genus, which is terrestrial, consists wholly of small shells, the largest species we know scarcely exceeding an inch in length. Several of the species are common in this country; in the southern parts of Europe, particularly the islands of the Mediterranean, they appear to abound to profusion."

Sweet, Robert, F. L. S., Author of various Botanical Periodicals, &c.: The British Warblers. Being an Account of the Genus Sýlvia, illustrated by beautifully coloured Figures, taken from living specimens in the Author's Collection. The Drawings by E. D. Smith. London. 8vo. Nos. I. to III.

This little work is so far valuable, as it makes us intimately acquainted with a genus of songsters which, however much admired in our groves and thickets during the midsummer months, yet, from their retired habits during their annual visit, are not readily distinguished, and never before have been so familiarly described. Mr. Sweet has already described the Sýlvia rubètra, the furze-chat; S. *P*hœnicùrus, the redstart; S. *L*uscínia, the nightingale; S. horténsis, the greater pettichaps; S. cinèrea, the larger white-throat; S. *T*róchilus, the yellow willow-wren; S. hippolàis, the lesser pettichaps; S. sylviélla, the lesser white-throat; S. atricapílla, the black-cap;

S. sylvícola, the wood-wren; and the S. provinciàlis, the Dartford warbler; all of which he has figured. To these will be added, in continuation, Sýlvia locustélla, the grasshopper-warbler; S. phragmìtes, the sedge-warbler; S. arundinàcea, the reed-wren; S. Œnánthe, the wheat-ear; and the Sýlvia rubícola, the stone-chat.

Besides scientific descriptions, Mr. Sweet has added interesting particulars of their nature, powers of song, and directions for catching and keeping them in health all the year round.

Botanical Periodicals.

1. *Curtis's Botanical Magazine, or Flower-Garden displayed;* New Series. Edited by Dr. Hooker. In 8vo Numbers, monthly. 3*s.* 6*d.* col.; 3*s.* plain. No. XVI.

2. *Edwards's Botanical Register.* Continued by John Lindley, F.R.S. L.S. &c. In 8vo Numbers, monthly. 4*s.* coloured. No. II.

3. *Botanical Cabinet.* By Messrs. Loddiges. In 4to and 8vo Parts, monthly. Large paper, 5*s.*; small paper, and partially coloured, 2*s.* 6*d.*

4. *The Botanic Garden.* By B. Maund. In small 4to Numbers, monthly. Large paper, 1*s.* 6*d.*; small paper, 1*s.* No. XL.

5. *The British Flower-Garden.* By Robert Sweet, F.L.S. In 8vo Numbers, monthly. 3*s.* No. LXII.

6. *Flòra Australásica.* By Robert Sweet, F.L.S. &c. In 8vo Numbers, monthly. 3*s.* coloured; 2*s.* plain. No. XI.

7. *Geraniàceæ.* By Robert Sweet, F.L.S. &c. In 8vo Numbers, monthly. 3*s.* No. C.

8. *Cistíneæ.* By Robert Sweet, F.L.S. &c. In 8vo Numbers, every alternate Month. 3*s.*

9. *The Florist's Guide and Cultivator's Directory,* &c. By Robert Sweet, F.L.S. &c. In 8vo Numbers, monthly. 3*s.* coloured; 2*s.* plain. No. X.

10. *Medical Botany,* &c. By John Stevenson, M.D., and James Morss Churchill, Esq. Surgeon. In 8vo Numbers, monthly. 3*s.* 6*d.* No. XVI.

These works are analysed monthly in detail in the *Gardener's Magazine,* on account of the remarks on their culture, which would be of no use in a work like the present. We shall here, therefore, confine ourselves to enumerating and occasionally figuring those species which have been newly introduced to our gardens or herbariums, or such as are still rare, or in some way or other calculated to be interesting or remarkable to the naturalist. At no period has this country stood any thing like so high, in botanical periodicals, as at present; and at no former period were so many new plants yearly introduced to the country. Mr. Barclay, of Bury Hill, has, for a number of years past, annually received the seeds of many new species, from his correspondents in South America and India, which are figured as they come into flower, in different works; but especially in those of Mr. Sweet. Mr. William Baxter, the collector of Mr. Henchman, sent to the Clapton nursery, a few years ago, one of the richest collections, from New Holland, that have been brought from that country since the time of Mr. Brown's visit; and these are figured, described, and named, as they come into flower, by Mr. Sweet, in his *Flòra Australásica.* Mr. Douglas has sent home, to the Horticultural Society, more new and beautiful hardy herbaceous plants, from North America, than were ever before introduced by an individual from any country. These are beautifully figured in the *Botanical Register,* and are the more valuable as being fit for the open garden in every part of the island. A number of other collectors and patrons might be named; and perhaps the king's garden at Kew should not be omitted, though it is to be regretted that there should be such a want of community of feeling between the heads of that establishment and the other British patrons of botany. A number of collectors have been sent, at the king's expense, to different parts of the world; and many new plants have been introduced and flowered at Kew. Few of these, however, have been figured in any of our periodicals; and not a few of them, it is generally alleged, have been lost to science, and to the country, after being introduced, from having neither been perpetuated by the press, nor by dissemination among botanical cultivators. Of late, however, since the editorship of Curtis's *Botanical Magazine* was committed to Dr. Hooker, some plants have been figured in it from Kew; and we should be most happy to see their number increased. A different policy from that liberality of sentiment and action, which may now be said to pervade almost every private and public establishment or institution of this country, is sure to carry with it its own reward. The names of various other individuals, patrons, and collectors, who have rendered essential service to botany, will occur in the course of our future botanical notices.

Curtis's Botanical Magazine, and the *Botanical Register*, have both materially improved within the last year. The *Botanical Register*, from containing most or all of the new plants introduced by the Horticultural Society, from the great care with which its plates are executed, and the judicious remarks on culture and general habit, by Mr. Lindley, is, in consequence, the superior publication. We should like to see both of them further improved by their editors' giving the accentuations, derivations, indications, and literal English names, in the manner which we have done in the *Gardener's Magazine*, and in the present work. If we were the public we should insist on this being done; and we rather wonder that Mr. Lindley, whom we know to be infinitely superior to the mean feeling of taking offence at our hints, has not, before this time, adopted these improvements.

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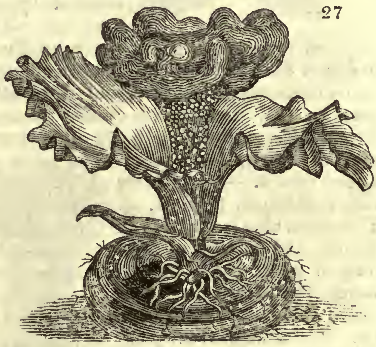

The most curious plant in the *Botanical Magazine* is the *A*rum campanulàtum (*fig.* 27.), which is cultivated in the East Indies, as the yam is in the West, for its root. The rarest plant figured is the Bignòn*ia* Colè*i*, elsewhere noticed. (p. 67.) The common annual globe amaranth has found a place here, as some camellias and picotee carnations did in former numbers, which we cannot help regretting, as unsuitable to a botanical publication of the first rank.

The *Botanical Register*, besides some beautiful new plants by Mr. Douglas, from the N. W. coast of North America, contains the *D*iospy̆rus *Mabòla* (*fig.* 28.), a shrub or small tree from the Philippine Islands, producing a hard, compact, excessively black kind of ebony; and a fruit, something like a large quince, described as covered with a bright brown coat, which encloses a pink or rose-coloured flesh. Its flavour is said to be agreeable, and its qualities wholesome. There are only two plants in England; one at Kew, and the other in the Horticultural Society's garden at Chiswick. The figure in the *Register* from which ours is copied, is of the quarto size, from a drawing by Mr. Lindley.

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One of Mr. Douglas's new plants is Œnothèra pállida, a handsome creeping-rooted hardy perennial, well calculated for coming into universal culture. A good idea of the plant may be formed from a figure of Œnothèra speciòsa. (*fig.* 29.)

Loddiges's Botanical Cabinet, contains ten figures, one or two of which are new plants, and some of the others curious old ones. Stapèl*ia* stellàris (*fig.* 30.) is rather a scarce species of a family very numerous in the deserts between the ridges of mountains above the Cape of Good Hope, and which, with other succulent plants, are, by their fleshy structure and having scarcely any pores in their cuticle, enabled to retain water sufficient to enable them to survive the long periods of drought which prevail in those regions. The plants of this genus are, to the eye of a common observer, without leaves, these being substituted by scale-like protuberances on the branches. The flowers may be considered as large in proportion to the size of the plant, the latter being seldom above a foot high. They have a singular character of richness in colour and succulency of texture, and smell strongly of sulphurated hydrogen or carrion. Only two species of this genus were known to Linnæus in 1762. In our *Hórtus Británnicus* 200 species are enumerated as cultivated in Britain, or having been introduced into it. — *E*uphórb*ia* càput Medùs*æ*. (*fig.* 31. *a*). This plant also is a native of Africa, and belongs to a family of which there are upwards of 100 species. It is called Medusa's head from the circumstance of the principal shoots or branches producing from their extremities numerous small branches all round a sort of head which is formed there. These small branches (*b*), in conformity with the general tendency of the mind to compare ideas, and the taste of the early part of the eighteenth century, when the plant was discovered, for allusions to classical antiquity, were supposed to bear a resemblance to the snakes, instead of locks of hair, with which the head of the Gorgon Medusa was invested by the Greek mythology. All the species of *E*uphórb*ia* abound in a milky fluid, which is exceedingly acrid, and will raise blisters on the skin. That of an annual British species, *E. h*elioscòpia, or Sun Spurge, is used by country people to destroy warts; that of *E.* càput Medùs*æ*, now before us, is said, when thickened, to make a very good birdlime.

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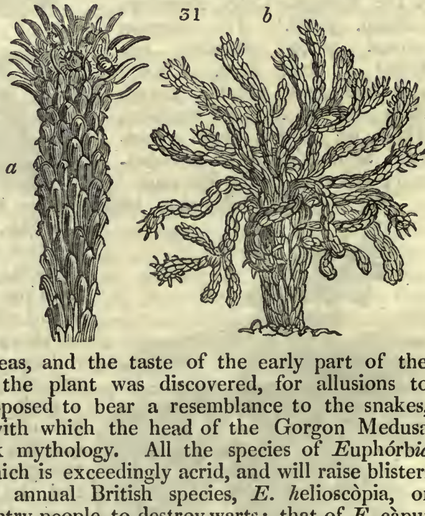
31 a b



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Flòra Australásica contains some fine plants, never before figured: among others, Hàke*a* lineàris (*fig.* 32.); Proteàce*æ*. A handsome, bushy, evergreen shrub, sent from the south coast of New Holland, by Mr. W. Baxter, C.M.H.S., the collector of Francis Henchman, Esq. F.L.S. H.S., to Mr. Mackay, F.L.S. H.S., of the Clapton nursery. Sphenótoma (*sphēnō*, to connect together, *toma*, a slice or section; joined filaments of the stamens) grácilis, Epacrídeæ; and Pomadérris (*pōma*, a lid or cover, *derris*, a membrane; lid of the capsule) díscolor (*fig.* 33.), are also new plants in this very judiciously contrived and well conducted periodical.

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Sweet's British Flower-Garden contains some very ornamental plants, and *P*apàver alpìnum (*fig.* 34.), a beautiful little alpine, with white petals, from that very interesting old botanic garden at Chelsea, which formerly was under the care of the celebrated Miller, and is now directed by Mr. Anderson, a most curious naturalist: *Geraniàceæ* displays some beautifully coloured plates of showy Pelargòniums: and that most economical and superiorly executed work, *Maund's Botanic Garden*, contains Potentílla formòsa, a truly beautiful and desirable plant; and the Virginian tobacco, which forms a handsome flower as well as snuff and segars. The *Medical Botany* of Messrs. Stephenson and Churchill, is a well executed work, particularly as respects the colouring of the plates; besides some common British plants, the present number contains Cephaèlis (*kephale*, a head; flowers in heads) *ipecacuánha* (*ipe*, an aboriginal word in Peru for root, *cacuan*, an aboriginal distinction for that root), Ipecacuan (*fig.* 35.), a perennial herbaceous plant, found in moist woods near Rio Janeiro, and in other provinces of Brazil; but hitherto rare in English hot-houses. It is imported in large quantities by the druggists, and forms the well known and generally employed emetic.

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Vigors, N. A., Esq. A.M. F.R.S. L.S. and G.S. Secretary of the Zoological Society, Editor, with the cooperation of several other distinguished naturalists: The Zoological Journal. No. XI., September to December 1827. 8vo, 4 plates. 10*s*. coloured; 7*s*. 6*d*. plain.

We intend taking an early opportunity of reviewing this work from its commencement. The present number contains fifteen articles by distinguished zoologists, and twenty-four analytical notices of books. The plates represent three rare species of fish: the Polybrachìone (*polys*, many, *brachīon*, arm), a singular marine animal, discovered on the shores of the Caribean sea, by the Rev. Lansdown Guilding; a fossil jaw in a fragment of slate; and the *F*èlis plániceps, a new species of cat from Sumatra.

Woods, Henry, Esq. Honorary Secretary of the Literary and Scientific Institution of Bath: An Introductory Lecture on the Study of Zoology, delivered there. Bath. 8vo, pp. 92.

Jennings, J.: Ornithologia; or, The Birds. A poem. London. 12mo.

The notes are said to be well compiled, and to convey much valuable information.

Jardine, Sir *William,* Bart. F. R. S. &c. and *P. J. Selby,* Esq. F. L. S. &c.: Illustrations of Ornithology. Parts I. and II. London. Royal 4to, Plates.

Selby, P. J., Esq. F. L. S. &c.: Illustrations of British Ornithology. Water Birds. London. Folio. Nos. II. and III.

Flòra Médica; containing Botanical Descriptions, Medical Properties and Uses, Chemical Analyses, Preparations, &c., of the Medicinal Plants comprised in the Pharmacopœias of the Three British Colleges: also, an Introduction to General Botany; a copious List of Botanical Terms and Definitions; Lists of Indigenous and Poisonous Plants, &c. London. In monthly Numbers, 8vo, each with Six coloured Plates. *2s. 6d.* Nos. I. to VI. are published.

Thompson, J. V., Esq. F.L.S., Surgeon to the Forces: Memoir on the Pentacrìnus (*pentē*, five, *crinis*, hair; hair-like protuberances) europæ'us, a recent species of Star-fish, discovered in the Cove of Cork, July 1. 1823. 4to, 2 pls. *2s. 6d.*

Ker, John Bellenden, Esq., an eminent British Botanist, author of many articles in the *Botanical Magazine* and *Botanical Register: I*rideàrum Genera cum ordinis charactere naturali, specierum enumeratione synonymisque. Brussels. 8vo, pp. 158.

Mr. Ker had arranged, in the *Botanical Register* and some other periodicals, various genera of this very natural family. He has here brought together the whole of his labours, and arranged *I*rídeæ under thirty genera.

Martin, J. P.: A Geological Memoir of a Part of Western Sussex; with some Observations upon Chalk Basins, the Weald Denudation, and Outlines of Protrusion. London. 4to, bds., 1 Map and 3 sectional Plates. 1*l.*

Stark, John, F.R.S.E. and M.W.S.: Elements of Natural History, adapted to the present state of the Sciences. Edinburgh. 8vo, vol. 1.

This work is intended not only to explain all the terms in use in the different departments of natural history, but to give the generic characters of the whole animal kingdom, and descriptions of the principal species.

The Transactions of the Linnean Society of London, Vol. XV. Part II. London. 4to, 18 Plates. 2*l.*

Smith, Sir *James Edward,* M. D. F.R.S. &c. President of the Linnean Society: The English Flora. Vol. IV. London. 8vo.

This great work is now completed; a distinguished botanist has promised to review it in our next Number; and, therefore, we shall only here record the remarkable coincidence of its estimable author having died on the day of its publication.

France.

Férussac, M. le Baron *de*, Director, assisted by editors for the different Departments: Bulletin des Sciences Naturelles, &c. Paris. 8vo, monthly Numbers. *35 frs.* per annum. The last Number published is No. 2. for February.

The object of this work is to give an epitome of the discoveries in natural history, and an account of the works published on the subject, in every part of the world. It forms a section of a plan, which embraces all the sciences, and for comprehensiveness of intention at least, has never before been equalled. The execution of such a plan necessarily requires a union of scientific knowledge, talent, and industry rarely effected, and the director has taken the only means in human power to combine these requisites, that of appointing an editor for each department. The work, we believe, has hitherto been conducted as well as could be expected, and may be considered as essential to the scientific naturalist, whatever may be his country. We shall have recourse to it in common with other foreign works, in order to make known to our readers the progress of natural history generally throughout the world, and particularly on the Continent.

Audouin, Ad. Brongniart, et *Dumas,* MM.: Annales des Sciences Naturelles; Journal complémentaire des Annales de Chimie et de Physique, comprenant la Physiologie Animale et Végétale, l'Anatomie comparée des deux Règnes, la Zoologie, la Botanique, la Minéralogie, et la Géologie. Paris. 8vo, monthly Numbers. 36 *frs.* per annum. No. 13., for January, is the last which has come to hand.

The object of this work is the same as that of the *Bulletin des Sciences Naturelles;* it includes the additional subject of chemistry, and is, we believe, very well conducted.

Brogniart, Adolphe: Histoire des Végétaux fossiles. No. 1. 4to, plates. 16*s.*

Buffon, M. le Comte *de*: Œuvres complètes, mises en ordre et précédés d'une Notice historique par Richard: suivies de deux volumes sur les Progrès des Sciences Physiques et Naturelles depuis la mort de Buffon, par Cuvier. Vol. 25. 8vo. 8*s.*

Chevallier, M. *de:* Flore générale des Environs de Paris, selon la méthode naturelle, accompagnée de 18 tableaux iconographiques, formant une suite de *Genera* propre à rendre l'étude plus facile. 8vo. Vol. 2. 2 parties.

Cuvier, M. le Baron *de:* Histoire Naturelle des Mammifères. Livraison 57. Fol., coloured plates. 1*l.*

Dargassies, M.: Lettres à Anaïs sur la Botanique. 2 vols. 12mo.

Descourtils, M. *de:* Flore Pittoresque et Médicale des Antilles. 8vo, fig. col. Nos. 82, 83, and 84., each 5*s.*

Anon.: Dictionnaire Classique d'Histoire Naturelle, par MM. Audouin, Isid. Bourdon, &c. et Borg. de Saint Vincent, ouvrage dans lequel on a ajouté pour le porter au niveau de la Science, un grand nombre de mots qui n'avaient pas fait partie des Dictionnaires antérieurs. Tom. 12. (Pan—Piv.) 8vo. 12*s.* Plates to ditto, No. 12. 5*s.*

Anon.: Dictionnaire des Sciences Naturelles, dans lequel on traite méthodiquement des différens êtres de la Nature, &c. 8vo. Vol. 51. 9*s.* Plates to ditto, No. 51. 1*l.* 1*s.*

Tussac, Le Chevalier, F.R.: Flore des Antilles, ou Histoire générale botanique, rurale, et économique des Végétaux indigènes de ces îles et des Exotiques qu'on est parvenu à y naturaliser, décrits d'après Nature et classés selon le Système sexuel de Linné, et la méthode naturelle de

Jussieu. Coloured plates, beautifully executed. Tom. 4., fifth and sixth livraison. 2*l.* This work will be completed in four volumes.

Fontelle, Julia de: Manuel de l'Herboriste, de l'E'picier-droguiste et du Grainier-pépiniériste-horticulteur. 2 vols. 18mo. 9*s.* 6*d.*

Temminck, M.: Nouveau Recueil de planches coloriées d'Oiseaux, pour servir de suite et de complément aux planches enluminées de Buffon, &c. Folio. No. 76. 1*l.*

Humboldt, M. le Baron *de:* Tableaux de la Nature, ou Considérations sur les Déserts, sur la Physionomie des Végétaux, sur les Cataractes de l'Orénoque, sur la Structure de l'action des Volcans dans les différentes Régions de la Terre. 2 vols. 8vo. 16*s.*

Roux, Polydore de: Iconographie Conchyliologique, ou Recueil de planches lithographiées et coloriées, représentant les Coquilles Marines, Fluviatiles, Terrestres, et Fossiles, décrites par Delamarck, Sowerby, Swainson, de Ferussac, de Blainville, Risso, &c. et autres inédites. 4to, plates. No. 1. 13*s.* 6*d.*

Odolant, Desnos: Précis de Minéralogie moderne, précédé d'une Introduction Historique, et suivi d'une Biographie, et d'un Vocabulaire. 2 vols. 8vo.

Anon.: Histoire des Animaux, précédée d'un Précis de l'Histoire Naturelle de l'Homme. 12mo.

Redouté, M. *de:* Choix des plus belles fleurs prises dans différentes familles du regne végétal. Coloured plates. Livraison 7me. 4to. 18*s.*; folio, 1*l.* 16*s.*

Germany and Italy.

Hedwig, J.: Species Muscorum frondosorum descriptæ et tabulis æneis color. illustratæ. Suppl. 3. cum script. a F. Schwägrichen. Vol. 1. 8vo. twelve parts. Leipz. 1*l.* 16*s.*

Reichenbach, L.: Icones Plantarum rariorum et minus rite cognitarum indigenarum exoticarumque. Centur. 5. Dec. 1—6. 60 plates. 4to. Leipz. 2*l.* 2*s.*; coloured, 4*l.* 4*s.*

Lachmann, H. W. L.: Flora der Umgegende von Brunschweig, I. Theil. 8vo. Braunswick. 10*s.*

Proteus, M. *de:* Zeitschrift für Geschichte der gesammten Naturlehre bearbeitet in Verbindung mit mehreren Gelehrten und herausgegeben von Dr. K. W. G. Kastner. Band 1. Heft 1. 8vo. Erlangen. 5*s.*

Stefano della Chiaje: Memorie sulla Storia e Notomia degli Animali senza Vertebre. 4to. Fasc. 2. 3. 4. Napoli.

Art. III. *Literary Notices.*

A'LGÆ *of Great Britain.* — Dr. Greville is engaged in preparing for publication a work, in one volume 8vo, upon the *A'*lgæ of Great Britain. As the author is desirous of rendering this most interesting department of botany as intelligible as possible, the genera will be carefully illustrated in twenty-five plates, and the descriptive letter-press written entirely in English. In a distinct portion of the work, however, a synopsis will be given in Latin of all the known genera, exotic as well as British, and a systematic enumeration of all the known species.

Medical and Physiological Essays are preparing for publication, by Dr. Forster, of Boreham, near Chelmsford. Among other curious articles they will contain an essay on the botany of the middle ages, and one on the physiology of spectral illusions.

PART III.

COLLECTANEA.

The facts, descriptions, or speculations intended to occupy this division of our work, are such as have more relation to natural history as a science, than to its progress in any particular place or country; in other words, we devote this division to short communications, notices, extracts, or abridgments, of permanent interest, as distinguished from the Miscellaneous Intelligence composing Part IV., which is intended chiefly for what may be called news, or notices of local and temporary interest. This explanation of our arrangement will the better enable our friends and contributors to understand what will be acceptable, and will prove to every reader who is favourable to our undertaking, how easy it will be for him to render us assistance.

Art. I. *The General Subject.*

The Circular System.—Now, there is incontestible evidence to prove that the same system which is found to govern the heavenly bodies — a system plainly circular — is typically represented on earth, and is that upon which the whole of organised matter has originally been planned. If either the animal or the vegetable kingdom be attentively considered, they will each present a certain number of primary divisions, following each other in a series of affinity. They will also have this remarkable peculiarity, that the last will so intimately resemble the first, that the series returns again to the point from which the investigation commenced; and thus by the union of the first division with the last, the whole can only be represented under the form of a circle. Again, if any one of these primary divisions be examined singly, the same disposition will be found; each of these secondary groups will form their own circles of affinity. These again are found to contain smaller circles, till at last the enquiry becomes limited to the individual species. (*Swainson*, in the *Winter's Wreath* for 1828, p. 295.)

Spontaneous Organisation of Matter. — M. Bory de St. Vincent has occupied himself for some time past with a variety of microscopic observations, having for their object to prove the natural tendency of matter to become organised. Observing the appearances successively presented in water exposed to light, he thought he saw, for the first time, matter assume the aspect of a simple mucosity, without colour or form. If the water contains any animal substance, it produces a pellicle of this mucosity at its surface, then becomes turbid, and discloses an infinity of living atoms, if we may so call those monads, which, after being magnified a thousand times, are not so large as the point of a needle, and which yet move in all directions with prodigious velocity. This is what M. Bory names matter in the living state. When the water is exposed to the air and light, there quickly forms what is named the green matter of Priestley, which many observers have supposed to be the first state of certain confervæ, or plants of a like nature. M. Bory thinks that it is a combination of a more general form, and only susceptible of entering into the composition of these plants, as well as of the animalcules which issue from it, and which produces them.

He names this combination matter in the vegetative state. It is by it that the infusory animals are rendered green. Those which colour oysters, according to M. Gaillon's observations, produce this effect, as M. Bory says, only because they are themselves coloured by the green matter. It colours, in the same manner, the water and the shells of these oysters; and it would not be impossible to find some tinged directly by this matter, without any animalcules having penetrated into them. (*Jam. Phil. Jour.*, Dec. 1827, p. 195.)

The French Philosophers of the present age have acquired great and deserved fame by their splendid discoveries in physiology, geology, and comparative anatomy; but, as regards the natural system, or that which is to develope the plan of creation, it is not too much to say, that the book of nature, to them, has been hermetically sealed. Their discoveries will, indeed, remain, for these regard things which are immutable; but their systems and theories, formed either without any reference to religion, or in direct opposition to its greatest truths, are even now fast tumbling to decay. They may, indeed, be remembered, but only as lamentable instances of the infirmity of our nature, which, taking not God for its guide, perverts his works to inculcate the baneful principles of materialism and infidelity. (*Swainson*, in the *Winter's Wreath* for 1828, p. 298.)

Art. II. *Zoology.*

A new kind of Cloth fabricated by Insects. — The larvæ of the butterfly, *Tínea punctàta*, or *T.* padílla, have been directed by M. Habenstreet, of Munich, so as to work on a paper model suspended from the ceiling of a room. To this model he can give any form and dimensions, and he has thus been enabled to obtain square shawls, an air balloon four feet high, and a woman's complete robe, with the sleeves, but without seams. One or two larvæ can weave a square inch of cloth. A great number are, of course, employed, and their motions are interdicted from the parts of the model not to be covered by oiling them. The cloth exceeds in fineness the lightest gauze, and has been worn as a robe over her court dress by the Queen of Bavaria. (*Newton's Journal of the Arts*, Dec. 1827.) — We have no doubt the same object might be effected by directing the labours of the larvæ of various British moths or butterflies, or perhaps spiders; and we should be glad to hear of some reader of leisure attempting such a thing. M. Samouelle, Blackfriars Road, we believe, could give instructions, and supply eggs and larvæ. — *Cond.*

Method of killing Insects for the Use of Naturalists. — The following method is by M. Ricord: — The insect is to be fixed on a piece of cork, and put under a jar or vessel with a little ether; the latter being placed either in a capsule, or on the plate on which the jar or glass is placed: the vessel should apply closely, that the vapour of the ether may be retained, and the air within be prevented from changing its place. The insect thus immersed in the ethereal atmosphere will soon die, without having time to hurt its form or appearance by violence. (*Bul. Un.*)

The Ant and the A'phis, or Plant Louse. — Mr. Carpenter happening once to beat down a number of áphides out of a stunted oak-tree, at the foot of which was an ants' nest, was very much surprised at seeing soon afterwards the ants busily employed in carrying up the áphides and carefully replacing them again upon the leaves of the tree; they feeding upon the honey-dew, which, it is well known, is produced by the àphis. (*Gill's Tech. Repos.*, April, p. 201.)

White Cats with blue eyes, are always deaf. This is a very remarkable fact, and I believe not generally known, — *E. W. S. Chelsea, March* 20.

Art. III. *Botany.*

Tabasheer (the Arabic word for liquor) is a very remarkable substance, occurring only in particular situations and in particular plants, and chiefly in the joints of the bamboo. It is called by the Hindoo physicians bamboo manna, and milk, sugar, or camphor of bamboo, and appears to be a secretion from the joints of the seed in a state of disease, malconformation, or fracture. The secretion is made in the cavity within the reed, and on the upper and under surface of the joints; the ordinary quantity produced by a disorganised joint or internode, is four or five grains. The chemical composition of tabasheer is undetermined; it is pure silex, according to some; and silex 70, and potash 30, according to others. According to an analysis by Dr. Turner, Professor of Chemistry in the University of London, in the April number of *Brewster's Journal*, it consists of sílica, containing a minute quantity of lime and vegetable matter. The physical properties of tabasheer are remarkable; its refractive power is lower than that of any other body, when solid or fluid; with certain oils, which it imbibes, it becomes as transparent as glass; it absorbs water, and becomes as white and opaque as if it had been covered with white lead. In India it is used medicinally as a tonic, or chewed with betel, to renovate the constitution. It is also highly prized as an aphrodisiac. Silex, it is well known, exists in wheat straw, and in the stems of other grasses; physiologists, in general, consider it as a foreign ingredient, "an intruding element which the plant had derived from the peculiar soil in which it vegetated;" but Dr. Brewster, from certain experiments made with *E*quisètum hiemàle, is of opinion that the silex is an integral portion of the plant itself. (*Brewster's Jour.*, April.)

Botany in the Mauritius. — Sir Galbraith Lowry Cole, the governor, has appointed that indefatigable botanist, Mr. Bojer, Professor of Botany in the Royal College at Port Louis. The governor, as well as Lady Cole, have done every thing in their power to aid the cause of botany; and have encouraged the transmission of plants to Europe to a very great extent. Professor Hooker has lately published in the *Botanical Magazine* (April, 1828) a beautiful species of Bignòn*ia*, named in honour of the governor by Mr. Bojer, in testimony of his respect and gratitude. Bignòn*ia* Colè*i* (*fig.* 36.) is a shrub reaching to the height of from 10 to 15 feet, and bearing red flowers on the main stem remote from the leaves. The plant itself has not yet been introduced into Britain, but may soon be expected at Bury Hill.

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The Krubut, or Great Flower of Sumatra. — Rafflès*ia* (in honour of the late Sir Stamford Raffles, governor of Sumatra, and founder of the Zoological Society) Arnóld*ii* (in memory of Dr. Arnold, the discoverer in 1818), is one of the most extraordinary of vegetable productions. It is a parasite, growing in woods, on the roots and stems of those immense climbers, generally of the genus *V*ìtis, which are attached, like cables, to the largest trees in the forest. The flower constitutes the whole of the plant, there being neither leaves, roots, nor a stem. It is a true parasite, growing out of another plant in the manner of the mistletoe, and not on the decayed surface of plants, as the common fern on the trunks of old oak pollards. In the latter case the proper term is epiphyte (*epi*, upon, *phyton*, a plant). The flowers are of one sex, and only the male has yet been sent to England. The breadth of a full-grown flower (*fig.* 37.) exceeds 3 ft.; the petals (*a*), which are subrotund, measure 12 in. from the base to the apex, and it is about a foot from the insertion of the one petal to the opposite one; what is considered the nectarium (*b*) would hold 12 pints; the pistils,

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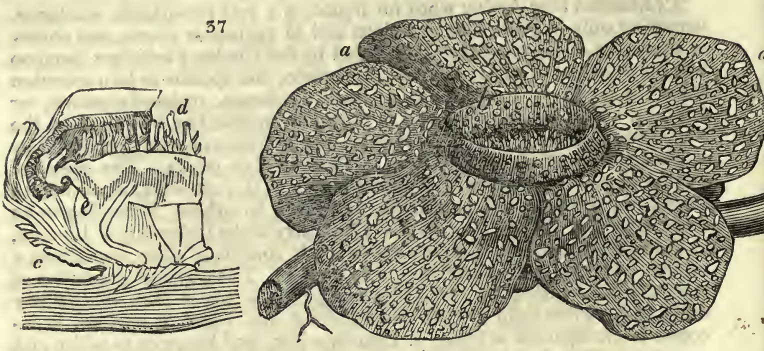

which are abortive (*fig.* 37. *d*), are as large as cows' horns, and the weight of the whole is calculated to be about 15 lbs. The flower, fully blown, was discovered in a jungle, growing close to the ground under the bushes, with a swarm of flies hovering over the nectary, and apparently laying their eggs in its substance. The colour of the five petals is a brick red, covered with protuberances of a yellowish white. The smell is that of tainted beef. The structure of Rafflès*ia* is too imperfectly known to admit of determining its place in the natural system; but Mr. Brown, from whose learned paper on the subject, in the Linnean transactions, this notice is taken, is inclined to think it will be found to approach either to Asarìnæ or Passiflòreæ. Its first appearance is that of a round knob (*fig.* 38.) proceeding from a crack or hollow in the stem or root. This knob, when cut through, exhibits the infant flower enveloped in numerous bracteal sheaths, which successively open and wither away as the flower enlarges, until, at the time of full expansion (*fig.* 37.), there are but a very few remaining, which have somewhat the appearance of a broken calyx. (*fig.* 37. *c.*) It takes three months from the first appearance of the bud to the full expansion of the flower. The fruit has not yet been seen by botanists, but is said by the natives, to be a many-seeded berry. The female flower differs little in appearance from the male, further than being without the anthers (*fig.* 37. *e*) of the latter. In Mr. Brown's observations on Rafflès*ia*, he observes, that it is not common for parasite plants to fix indiscriminately on the roots or branches of their stocks, as is supposed to be the case with Rafflès*ia*, and that " plants parasitic on roots, are chiefly distinguishable by the imperfect developement of their leaves, and the entire absence of green colour; that their seeds are small, and their embryo not only minute, but apparently imperfectly developed." The modes of union between a parasite and its supporter or stock, vary in different genera and species of this class of vegetables. Some, as the mistletoe and Rafflès*ia*, depend on the stock for nourishment during the whole of their existence; others, as the common broom rape, are originated in the soil, and afterwards, when they have attached themselves to their stock, the original roots die; other parasites, again, are originated on the stock, and in their more advanced state produce roots of their own. In some cases the nature of the connection

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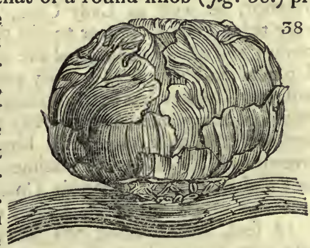

between the parasite and the stock is such, "as can only be explained on the supposition, that the germinating seed of the parasite excites a specific action in the stock, the result of which is the formation of a structure, either wholly or in part derived from the root, and adapted to the support and protection of the undeveloped parasite; analogous, therefore, to the production of galls by the puncture of insects." On this supposition may be explained, the connection between the flower Rafflèsia and the root from whence it springs. (*Trans. Lin. Soc.*, vol. xiii. p. 227.)

Art. IV. *Mineralogy and Geology.*

Colour of the Red Sea. — The colour of the Red Sea has given rise to various investigations. Dr. Ehrenberg, who accompanied Dr. Hemprich, ascertained that it was caused by a species of Oscillatòria, one of those small plants which are intermediate between animals and plants. (*Jam. Phil. Jour.*, Dec. 1827, p. 182.)

Footmarks of Animals in Sandstone. — Numerous impressions of the footsteps of quadrupeds have been discovered on a bed of red sandstone, near Lochmaben, in Dumfriesshire, between 60 and 70 ft. beneath the surface. Professor Buckland, to whom specimens of them have been sent, has given it as his opinion, that they were produced by the feet of a tortoise or crocodile, at a time when the rock was in a soft state, and before the 60 or 70 ft. of solid strata with which it is now covered had been superimposed. (*Ibid.*)

Fossil Shell attached to Flint. — Dear Sir, I enclose a sketch of a fossil shell attached to a flint (*fig.* 39.), which I found, some time ago, at Ditchingham, in this neighbourhood. I can offer you no theory, or other information respecting it.

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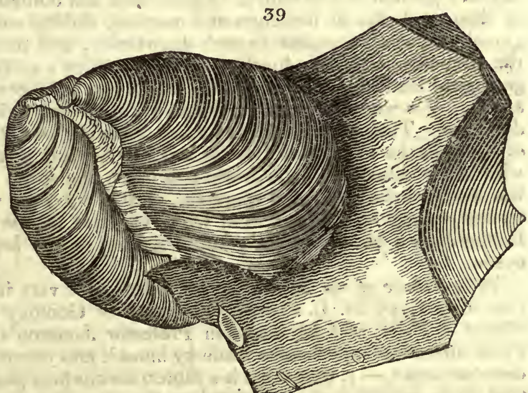
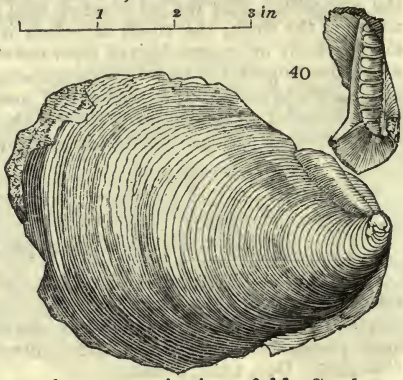


About a year and a half ago, as some workmen were digging in a gravel pit at Wortwell, within four miles of this place, they found the fragment of an elephant's tooth, weighing upwards of 3½ lbs. It was about 40 feet below the surface. This and the flint are in the possession of J. B. Scott, Esq. I am, dear Sir, &c. — *Daniel Stock. Bungay, April* 1. 1828.

The specimen figured by our correspondent, is evidently the fossil bivalve Inocéramus. No less than twelve species have been described by naturalists, of which three are peculiar to the upper chalk; four are common to the chalk and the subjacent green sand; one to the green sand and blue marl; one to the oak-tree clay; one other species common to the oak-tree clay, Falkstone marl, and green sand; one to the alum strata; and one to the mountain limestone. The species here represented appears to be a small variety of Inocéramus Cuvièr*i* of Sowerby, tab. 441. (*fig.* 40.) This genus is abundantly found in the diluvial gravel of the eastern counties, some fragments showing that the shells, in some cases, attained to considerable dimensions. Others are not more than a fourth of the size figured, and, from the circumstance of being commonly found in groups, show the gregarious habits of the fish in their original state. In the diluvium of Norfolk and Suffolk, they rarely occur in any other form than as casts in flint, or hard chalk, or occasionally with a fragment of the shell only adhering to the chalk nodules. These are dispersed in every part of this district, being found equally on the highest eminences and on the margins of the valleys. We give ready insertion to the communication of Mr. Stock, not because we attach an unnecessary importance to the present article, but from the desire to encourage local contributions, and notices of occasional discoveries in this or in any other department of natural science. The fossil elephant's tooth, and, judging from its locality, the Inocéramus also, are derived from the diluvial valley of the Waveney, which has afforded numerous specimens of the remains of animals, particularly in the higher parts, in the neighbourhood of Eye, Hoxne, Diss, Roydon, &c., and there is little doubt that similar relics exist, but have attracted little observation, in every portion of this valley. Agricultural and domestic operations, such as digging drains in meadows and marshes, sinking wells, and excavating gravel-pits, are favourable to such discoveries; and the communication of the circumstances, from local observers, leads to a useful concentration of geological facts. Our correspondent will oblige us by continuing his observations. We would suggest his endeavouring to trace the crag-beds in this direction. They seem to exist without the shells, or with slight indications of them, in the vicinity of Beccles and more westerly, and have been met with in the diluvium of the gravel-pits much higher up. Mr. R. C. Taylor has sketched the geological character of the Waveney valley, in his work on the geology of East Norfolk, with reference to the hypothesis of Mr. Robherds, on the supposed gradual sinking in the level of the German ocean.



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Temperature of the Interior of the Earth. — A very interesting paper on this subject, by M. L. Cordier, Professor of Geology in the Garden of Plants at Paris, will be found in Professor Jameson's *Journal* for April. From numerous experiments made by himself and others in mines, M. Cordier concludes, — 1. that there is a subterraneous heat peculiar to the terrestrial globe, which does not depend on the solar rays, and which increases rapidly with the depth; 2. the increase of this heat does not follow the same law all over the earth, it may be twice or three times as much in one country as in another; 3. these differences are not in constant relation with longitudes and latitudes; and, 4. the increase is more rapid than has been supposed.

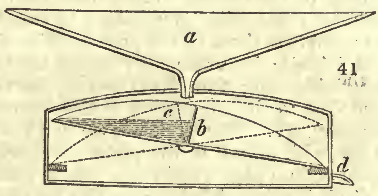
It is proper to state that the opinions maintained by the author are not new. The value of the memoir lies in its placing on a firm scientific basis what was formerly a mere hypothesis. M. Cordier, after much research, holds that an intense heat exists in the interior of the earth, that the external crust upon which we stand may be from 50 to 100 miles in thickness, that beyond this all within is occupied by a molten mass; he infers further, that the entire globe consisted originally of such a molten mass, the outer part of which became solid first, by throwing off its heat into the regions of free space; that by the continual escape of heat in this way, the solid crust is constantly thickening; that the earth, in short, is a *cooled star*, which has been extinguished only at its surface.

We cannot but regard this as one of the most curious and important truths ever given to the world; a truth which, though it has no immediate bearing on the arts of life, cannot be barren of useful consequences, since it gives us more correct ideas of the globe we inhabit, and promises to throw a flood of light on many abstruse and difficult questions in science. (*Scotsman*, March 29.)

Burmese Petroleum Wells. — Some of these are from 37 to 53 fathoms in depth, and are said to yield at an average, daily, from 130 to 185 gallons of the earth oil. The wells are scattered over an area of about sixteen square miles. The wells are private property, the owners paying a tax of 5 per cent. of the produce to the state. This commodity is almost universally used by the Burmans as lamp oil. Its price on the spot does not, on an average, exceed from 5*d.* to 7½*d.* per cwt. The other useful mineral or saline productions of the Burman empire are coal, saltpetre, soda, and culinary salt. One of the lakes affording the latter, which is within six or seven miles of the capital, was examined by the gentlemen of the mission. (*Crawford's Mission to Ava.*)

Art. V. *Meteorology.*

A Rain-Gauge, on a new and greatly improved construction (*fig.* 41.) has been invented by Mr. Samuel Crosley, Engineer, London, and described in *Gill's Technological Repository*, vol. ii. p. 17. Its superiority consists in its power of self-registering the quantity of rain fallen. It consists of a funnel (*a*) of the usual form, through which the rain passes to a vibrating trough (*b*), when, after a sufficient quantity has fallen into its higher side (*c*), it preponderates, discharges the rain, which escapes by a tube, and at the same time, by its vibratory action, moves a train of wheel-work and indexes, to record upon a dial-plate the quantity of rain fallen. We have not been able to learn that any instruments of this sort are actually on sale; but the invention is most ingenious, and ranks with Kewley's balance thermometer (*Enc. of Gard.*, § 1489.), which might also be made a registering thermometer on a similar principle.



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Destruction of an Oak Tree by Lightning. — The trunk of the tree was about 15 ft. in height, 1½ or 2 ft. in diameter at the branches, and 3 ft. in diameter at the root. The top of the tree was separated, as if by the stroke of a hatchet, and without any appearance of carbonisation; the trunk was torn into a thousand pieces, exceedingly small in size when compared with the original mass, and thrown to a great distance. Such was the division and destruction, as to induce the supposition that in certain cases the lightning might cause the entire dispersion of the tree. (*Bul. Un.*)

Rain at Bombay. — During the first days of the rainy season, the quantity that fell was thirty-two inches, and then all the roads became like rivers. In England, at an average, not more than the same quantity falls during the whole year. (*Jam. Jour.*, Dec. 1827, p. 182.)

PART IV.

MISCELLANEOUS INTELLIGENCE.

Art. I. *Natural History in Foreign Countries.*

FRANCE.

Natural History of Nubia. — M. Riffaud, of Marseilles, has lately returned to his native city from Egypt, bringing with him, 1. a vast collection of plants, collected during his travels in Nubia and Egypt; 2. drawings of the fishes, insects, and testaceous animals found in the Nile and its neighbourhood; 3. nearly 1000 drawings of mammalia, reptiles, birds, and insects, partly found in Nubia and partly in Libya and Egypt; 4. a series of drawings of remains of antiquity in Nubia and Egypt, and 160 hieroglyphical inscriptions collected among the ruins; 5. agricultural and chirurgical instruments, articles of dress and ornaments of the natives, topographical plans, meteorological observations. M. Riffaud has also kept a regular journal of his travels. He is now busy in arranging and classifying his numerous materials, preparatory to committing the important work which is to embrace them to the press. (*For. Quart. Rev.*)

A Histoire Naturelle des Poissons has been announced by Baron Cuvier, containing more than 5000 species, described from nature, and arranged according to the connection of their structure, with observations on their anatomy, &c. The work will be in 15 or 20 vols. in 8vo, or 8 or 10 vols. in 4to, with a part of the plates along with each volume. The plates will be on vellum paper, and some will be coloured. (*Ibid.*)

Cephalopodous Mollusca. — The Baron de Ferussac is preparing a complete monograph of cephalopodous (head-footed) animals, in folio, with numerous plates, taken chiefly from a very extensive series of specimens, in the possession of that distinguished naturalist. (*Ibid.*)

Mineralogy. — The Academy of Sciences, at its sittings of the 31st of December last, proceeded to the election of two corresponding members for the section of mineralogy. The section had presented two lists of candidates, one of mineralogists, properly so called, and the other of geologists, and expressed a wish that the readers should select one from each list. M. Mitscherlich, of Berlin, and Mr. Conybeare, of London, were the successful candidates. (*Ibid.*)

Physiology. — Among the competitors for the prize of physiology, founded by the late M. Monthyon, is M. Vimon, a physician at Caen, who comes forward with a collection of more than 2000 sculls of mammalia and birds, modelled in wax, and a numerous series of drawings and observations. This collection is the fruit of several years' research into the doctrines of Gall, relative to the seat of the moral and intellectual faculties of man and animals. We are informed that M. Vimon, after having attended Dr. Gall's course of lectures at Paris, left it with strong prepossessions against his doctrines, and on his return to Caen, prosecuted his researches with the express object of refuting them; but, after the fullest investigation, his enquiries have terminated in making him a thorough convert to the system. (*Ibid.*)

A Crocodile, at Chantilly, in France, is so tame and well-disposed, that he is caressed with impunity by the keeper, who endeavours, though not always with success, to induce visitors to follow his example. (*Newsp.*)

GERMANY.

Berlin, March 9. — A beautiful work is now publishing here, by the traveller Ehrenberg, giving a description of the plants and animals which he found in Egypt. The third volume of *Linnæ'a*, a Journal of Botany, by Dr. Schlechtendal, is about to appear. Continual accessions are making to the plants in the royal botanic garden, and these are published as they come in flower, by Professor Link and Director Otto, two of the most zealous botanists in Germany. — *N. S.*

A rich Collection of Minerals, which belonged to Lacarriere, a merchant of Leipsic, who died lately, has been bequeathed by him to the university of that city. (*For. Quart. Rev.*, February.)

Shells of Brazil. — The posthumous work of Dr. Spix on the shells of Brazil has just appeared, edited by Drs. Schrank and Martius. It forms one of the volumes of the interesting series of works on the natural history of Brazil, undertaken at the expense of the late King of Bavaria, by Drs. Spix and Martius, who travelled for several years over these magnificent regions. (*Ibid.*)

SWITZERLAND.

Flòra Helvética. — An extremely valuable work of its class, the result of thirty years' labour, is the long-promised *Flòra Helvética* of M. T. Gaudin, professor and pastor at Nyon, which is now completed in manuscript, and will form six volumes; the first of which is published, and the remainder will shortly appear. An interesting preface gives an account of the author's excursions during this long period, among the valleys and mountains of Switzerland. The author has followed the Linnean system; he is an enemy to the multiplication of species, and even thinks he has hardly gone far enough in reducing their number. He says, "Fateor etiam nunc, in mea Flora non paucas superesse formas, quæ omnino varietatis potius quam speciei lege describi debuissent." "I confess, that in my *Flòra*, even now, there remain not a few modifications which should be described as varieties rather than as species." A number of copper-plates, representing new species, are added to the work. (*For. Quart. Rev.*, February.)

The Helvetic Society for the Study of Natural History, will speedily publish the first volume of its *Memoirs*. (*Ibid.*)

ITALY.

Two Glass Jars of Olives and Olive Oil have been dug up at Pompeii. The olives are fresh, and both they and the oil are fit for use. The details of this remarkable discovery will be found in *Jameson's Journal* for April, and in the *Scotsman*, April 9.

RUSSIA.

Oural Mountains. — M. Engelhardt, professor of the university, has just returned to that city from a visit to the Oural Mountains, which he performed at the expense of the university. He has presented a very interesting report of his journey, of which he intends publishing a detailed narrative. He has made a great number of valuable observations on the geology and mineralogy of these countries; and has been enabled to correct, in many important particulars, the maps of the several provinces which he visited. (*For. Quart. Rev.*, February.)

Altai Mountains. — Another tour in Asia has been performed by Professor Ledebuhr, Dr. Meyer, and Dr. Bunge, to the Altai mountains, on the frontiers of the Chinese empire. This tour, the object of which was the almost unknown Flora of those remote regions, has proved eminently successful. The travellers have collected 1600 species of plants, of which nearly 500 are new; so that Professor Ledebuhr intends to publish a *Flòra Altàica.* Geography, statistics, zoology, and mineralogy were not neglected in the course of this excursion; the narrative of which is expected to be highly interesting, and will be published, as we are informed, first in English. (*For. Quart. Rev.*, February.)

Natural History of Siberia.—At the commencement of this month, Humboldt, the great naturalist and traveller, proposes to undertake a journey to Siberia, for the purposes of scientific research; to which object the Emperor Nicholas has contributed, by directing that every facility be afforded to the philosopher in his meritorious pursuits. (*Athenæum.*)

SWEDEN.

Three Species of Cat are described by Professor Thunberg, as inhabiting Scandinavia. These he names the *Lýnx* Lùpus, *L.* Càtus, and *L. V*úlpes, that is, the *F*èlis *l*upulìnus, boreàlis, and *v*ulpìnus of Linnæus. (*Bull. des Sciences Naturelles,* Fev.)

NORTH AMERICA.

Ornithology.—A splendid work on this subject is publishing at Philadelphia, by Charles Lucien Bonaparte, in folio numbers. It is the continuation of an equally splendid work by the late zealous and indefatigable Wilson. The birds figured by Bonaparte have, for the most part, been obtained from the Rocky Mountains; and the first volume, which was completed in 1825, contains nine plates, on which 22 land birds are figured, and 106 pages of letter-press, in which they are described. The same author has published a very useful and necessary appendix to Wilson's work, entitled, *Observations on the Nomenclature of Wilson's Ornithology.* Taking these works, in connection with the surpassingly splendid *Birds of America* of Mr. Audubon, the riches of the new world, in this department, promise to be fully and favourably made known to the old.

The Remains of a stupendous Crocodile were seen near New Orleans by Mr. Bullock. The animal must have been at least 150 ft. long, for Mr. Bullock measured the right side of the under jaw, and found it to be 21 ft. along the curve, and 4 ft. 6 in. wide. (*Bullock's Travels.*)

ART. II. *Natural History in London.*

THE *British Museum* was opened to the public in 1759, with the extensive collection of the celebrated Sir Hans Sloane. The additions it has since received by purchase and donation are numerous and extensive. The history of this institution is already sufficiently well known, and therefore we propose merely to notice from time to time such additions as may be made to the natural history department, or new regulations respecting the admission of the public to view or study the various collections of natural objects and the books treating of them. The library of the late Sir Joseph Banks is the last grand addition that was made to the natural history department, having been removed thither in November, 1827.

Linnean Society.—This Society was founded in 1788. At its opening a discourse, published in the first volume of the Society's *Transactions,* was read by the president, the late Sir J. E. Smith, on the rise and progress of natural history, in which the peculiar objects of this institution are pointed out. These may be summed up as attention to natural history in general, a particular regard to the productions of the British Isles, and a strict attention to the laws and principles of Linnæus, so far as they have been found to be good. The Society have just completed their 15th volume of *Transactions,* and the number of members now exceeds 600.

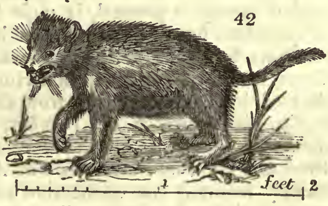
March 4. A communication from the Rev. Leonard Jenyns, of Cambridge, M.A. F.L.S., was read, on two British species of Plecòtus *Geoff.*, supposed to have been confounded under the name of long-eared bat.

March 18. After the meeting had assembled, the afflicting tidings of the decease of Sir James Edward Smith, their eminent and much beloved President, which had arrived during the day, having been communicated, an adjournment immediately took place.

April 1. Read, a commentary on the *Hórtus Malabáricus*, Part V., by Francis Hamilton, M.D. F.R.S. and L.S.

April 15. Read, a letter, addressed to the Secretary, from Charles Lucien Buonaparte, Prince of Mesignano, F.M.L.S., dated on board the Delaware, near Gibraltar, March 20. 1828, containing some curious facts relative to the migratory habits of certain birds. He observes, " A few days ago, being 500 miles from the coasts of Portugal, 400 from those of Africa, &c., we were agreeably surprised by the appearance of a few swallows, *H*irúndo úrbica and rústica. This, however extraordinary, might have been explained by an easterly gale, which might have cut off the swallows migrating from the main to Madeira, only 200 miles distant from us; but what was my surprise in observing several small warblers hopping about the deck and rigging! These poor little strangers, exhausted as they were, were soon caught and brought to me." These warblers consisted of Sylvia *T*róchilus, *E*ríthacus, suécica, or a nearly related species; and a fourth, probably a nondescript, having the plumage of an A'rthus.

Read, also, part of a valuable physiological paper, on the mammary organs of the Kangaroo, by John Morgan, Esq. F.L.S.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Among the presents were two valuable additions to the Society's New Holland collection, namely, a stuffed specimen of that curious quadruped, the Diadélphis *u*rsìna (*Linn. Tran.*, vol. ix. tab. 19.), vulgarly called the Botany Bay Devil (*fig.* 42.), and a remarkable new species of Fálco, with a crest; both presented by Mr. B. Leadbeater, F.L.S. Captain Ross, R.N. F.L.S., presented a small collection of dried plants, formed by himself in the late arctic expedition under Captain Parry.

Geological Society. — The anniversary of this institution, established, as its charter states, " to investigate the mineral structure of the earth," was held on the 15th of February. An address on the occasion was delivered from the chair, by W. H. Fitton, M.D. F.R.S. &c., the president, which will be found at length in the *Philosophical Magazine* for April. The leading feature of the address is the state of geology in Britain, though notice is also taken of the progress of the science in other countries. Reference is made to the printed *Proceedings* of the Society, and their *Transactions*, as the best records of the Society's contributions to geological science during the year. The Society are congratulated on the progress which has been made in the trigonometrical survey of Ireland, because the greatest benefit is derived to geology from good maps. The effective establishment of a Zoological Society is another source of gratification, because to the geologist it is of great importance to have ready access to cabinets, and to living specimens, in order to elucidate fossil remains of animals and plants. The fossil remains of the vegetable kingdom do not occupy, the President thinks, a just share of the attention of the botanists of England. " The distribution of plants upon the former surfaces of the globe, — its relation to the epochs of geological deposition, — the variations it may have undergone from change of climate, either by alteration of internal temperature, or of elevation above the sea — the former existence of vegetation in the more complex forms, in tracts where scarcely any traces of it exist at present, — are subjects which give rise to some of the most important general questions connected with the history of the globe, — and that require for their due consideration such an acquaintance with the characters of fossil vegetable remains, as none but the most skilful and experienced botanists can be expected to possess." Notice is taken of several valuable papers on the geology of foreign countries, of the donation of various specimens to the museum, and of some valuable publications to the library.

"In the speculative department of geology, nothing has been of late more remarkable, with reference to its history in this country, than the universal adoption of a modified volcanic theory, and the complete subsidence or almost oblivion of the Wernerian and Neptunean hypothesis, — so that what, but a few years since, it was by some considered as hardihood to propose in the form of conjecture, seems now to be established nearly with the evidence of fact. It is no longer denied, that volcanic power has been active during all the revolutions which the surface of the globe has undergone, and has probably been itself the cause of many of them; — and that our continents have not merely been shaken by some mighty subterraneous force, but that strata, originally horizontal, have thus been raised, shattered, contorted, and traversed, perhaps repeatedly, by veins of fluid matter; — operations which have produced phenomena, so nearly resembling those of recent volcanic agency, that to have so long disputed the identity of their cause, is one of the most remarkable proofs in the annals of philosophic history, of the power of hypothesis in distorting or concealing truth. Whatever, therefore, be the fate of the Huttonian theory in general, it must be admitted, that many of its leading propositions have been confirmed in a manner which the inventor could not have foreseen. The most striking modern support of these correcter views, is due to Von Buch and Humboldt, and to the facts and inferences derived by Dr. Macculloch from the country which gave birth to Hutton, and to his illustrator Mr. Playfair, and in which were made the experiments of Sir James Hall. More recently, a series of facts observed by Professor Henslow, in the Isle of Anglesea, has proved, in the most satisfactory manner, the connection of veins of trap with very high temperature; since the change produced upon the strata, through which the substances now occupying the veins were injected, has approached so nearly to fluidity, as to admit of their crystallisation, in forms different from any which the components of the rocks, if they had not been thus acted on, would have afforded. Sir Humphrey Davy's experiments on the fluids contained within cavities in crystals, are another striking and unexpected confirmation of Hutton's views: and our own *Transactions*, besides various incidental pieces of evidence derived from this country, supply the testimony of an unprejudiced witness to an earthquake on the coast of Chili, which brings almost before the eyes of the reader, the movement and permanent elevation of the land."

The good effects produced at both our universities by the geological instructions delivered there, have "given to the subject an impulse perhaps without example in the history of those institutions, and gone far to render natural science a permanent department of general education." Among the more recent causes which have accelerated the progress of geology in England, is stated to be the publication of the *Outlines of England and Wales* by Mr. Conybeare and Mr. Phillips, which is said to have "had an effect, to which nothing, since the institution of this Society, and the diffusion of the geological maps of England, can be compared. Regarding the *Outlines of England and Wales,* as the first general sketch of a country so complex as our own, it may be said, without fear of contradiction, that no equal portion of the earth's surface has ever been more ably illustrated; — nor any geological work produced, which bears more strongly impressed upon it the stamp of original talent for natural science." The geology of England acquires a great additional interest, " when we reflect that this island is in a great measure an epitome of the globe; and that the observer, who makes himself familiar with our strata and the fossil remains which they include, has not only prepared himself for similar enquiries in other quarters, but is already, as it were, acquainted by anticipation with what he is to find there. If, therefore, I were called upon to state in what manner those who have leisure, health, and talent for such enquiries, can most effectually advance the bounds of our sciences, and increase the reputation which England has begun to acquire in this department of natural knowledge, I should say, that it would be, — first, by rendering themselves accurately familiar with the geological phenomena of our own country; and then, by taking abroad with them the knowledge thus acquired, and comparing the phenomena with those of distant regions; since it is only from the multiplication of such comparisons that sound general views can be derived.

" But there are still tracts in the British islands, the geology of which is little known; more than one half of Ireland is in this condition, and no geological map has yet appeared of Scotland, rich and varied as that region is in a geological point of view.

" To those amongst us who are confined to England, the most useful task, perhaps, would be, when we have mastered the general relations of our series, to take some one portion of the subject; a group of strata, or even a single stratum, or any one of the numberless questions connected with their zoological and mineralogical relations, and to publish, in the form of monographs, the results of our enquiries. For it may be stated with confidence, that there is not any one of our strata, however familiarly it may be supposed to be already known, that would not, if thus treated, reward the most elaborate and minute examination.

" But those that are deprived of the privilege of travelling even in England, must not suppose that they can be of no service as geologists; or, if they belong to our body, that they are thus relieved from their obligation to be active in our cause: and there are two descriptions of persons,— the resident clergy, and members of the medical profession in the country, from whom what I am about to say may be more particularly deserving of attention. Such persons, if they have not yet acquired a taste for natural science, can hardly conceive the interest which the face of the country, in their vicinity, would gain, however unpromising it may appear, by their having such enquiries before them; how much the monotony of life, in a remote or thinly inhabited district, would thus be relieved; nor how much benefit they might confer on the natural history of their country. Even of those who have made some progress in geological studies, many, I apprehend, are prevented from investigating attentively the tracts where they reside, or from communicating their knowledge, by a belief that the geology of England itself is sufficiently known already; and that the district, with the phenomena of which they are themselves familiar, would have no interest or novelty for the world at large; whereas it may be asserted (and it were easy to produce examples from modern researches, in some of the counties near London), that there is no district that will not furnish sufficient interest and novelty to an attentive enquirer, not merely to repay his own exertions, but to instruct the most learned, and enlarge the bounds of our science.

" To landed proprietors, also, it can hardly be known, without some tinge of geological information, how nearly our subject is connected with agriculture; with an acquaintance with the nature and correctives of the soil; the supply of water and facility of effectual drainage, and numberless facts essential to the perfection of rural economy; the discovery and supply of stone, for building and the construction of roads; the choice of the line of roads and of canals, and the facility of their execution. All these are but a few of the topics that come strictly within the province of the geologist; and which are so essential to the prosperous management of landed property, that a geological map may, perhaps, with truth, be considered as not less necessary to the country gentleman, than the topographical plan of his estates."

This discourse is an admirable specimen of what, in our opinion, ought to be delivered annually by the president of every literary and scientific institution. It is true, not many, if any, of these could show that they have advanced their particular science or object so much as the Geological Society has done; but it would give the public a much better opportunity of judging than they now have, of the objects and efforts of such societies and institutions, if such annual summaries of their meetings and transactions were delivered to the members, and published to the world. It is evident, also, that such summary views would, in various ways, promote the prosperity of such societies.

The Society held two meetings in March, and two in April, at which some valuable papers were read. Of these, and of the Society's published *Transactions*, we shall afterwards give some account. (*Phil. Mag.* and *An. of Phil.*)

The Zoological Society was founded in April, 1826. The house No. 33. Bruton Street, was taken in that year, and fitted up for the museum, and a plot of ground in the Regent's Park was obtained for exhibiting a living collection. Sir T. Stamford Raffles was the principal founder and the first president of this Society. The second meeting of the Society took place in March, 1827, when, in consequence of the death of the president, the Marquess of Lansdown was chosen to that office.

The museum in Bruton Street consists of several thousand animals or parts of animals, the greater part of which have been voluntarily contributed. Last year, the collection which Sir Stamford Raffles formed in Sumatra, some valuable Eastern animals, a remarkable collection of horns by Major General Hardwicke, an ostrich by the king, and a number of presents by other individuals, were added, and during the present year various accessions have been made.

In the Society's menagerie and garden, situated on the north-eastern side of the Regent's Park, not far beyond the new St. Catherine's Church and Hospital, nearly one hundred living animals are exhibited in suitable paddocks, dens, and aviaries. Among the most attractive of these, are two beautiful llamas, one presented by the Duke of Bedford, the second by Robert Barclay, Esq., of Bury Hill; a leopard, presented by Lord Auckland; some kangaroos bred in this country, by the Marquess of Hertford; a pair of emus, bred at Windsor, by Lord Mountcharles; a Russian bear, presented by Lord Hertford. Specimens of the ratel, or Indian badger, ichneumons, tiger cats, badgers, monkeys, &c., add to the attractions of the menagerie, Some valuable animals, from the artic regions, have been lately presented by the Hudson's Bay company: such as Canadian lynxes, arctic foxes, porcupines, horned owls, &c. The ornithological department comprises several species of eagles, cranes, gulls, gannetts, cormorants, with various gallinaceous birds, &c.

Nearly 1000 members have already joined the Society. The annual payment is two guineas, and the admission fee five guineas; or the whole may be compounded for by a payment of twenty-five pounds. The Society will probably soon be incorporated, when, as is usual, the terms of admission will probably be raised. The gratification which the rich museum of this Society in Bruton Street, and their very interesting garden of living animals in the Regent's Park, are calculated to afford to persons of leisure and curiosity, is so obvious, that we are surprised the members are not many times more numerous than they are. We should have thought that, independently of all scientific or useful views, the circumstance of a member being able to give cards of admission to the museum and garden to his friends, would have been sufficient to have rendered this Society one of the most popular in the metropolis. We believe, if the Society were better known, this would be the case, and we wish to find it so, not only as extending innocent and instructive amusement, but as contributing to a science, which more than any other demonstrates the existence of design in its subjects.

In the first prospectus issued by this Society, one of their objects is stated to be, "the introduction of new varieties, breeds, and races of animals, for the purpose of domestication, or for stocking our farm-yards, woods, pleasure-grounds, and wastes." When this object of the Society comes to be better known, we have no doubt it will be most liberally supported by the wealthy and the patriotic.

We anticipate an extraordinary source of interest in the menagerie, which we should like to see combined with an arboretum and a collection of all the plants that will endure our climate, distributed over the whole of the Regent's Park, the common trees already planted there being cut out, as those belonging to the collection grow up to supply their places.

The secretary of this society is N. A. Vigors, Esq., one of our first zoologists, and editor of the *Zoological Journal.*

The Medico-Botanical Society of London. — This Society was established in 1821, for the purpose of especially promoting, by means of experiments and lectures, the sciences of medical botany, pharmaceutic chemistry, and materia medica. The necessity of such an institution must be very obvious, when it is stated, that, previously to its foundation, there was no Society for the investigation of the properties of plants, although there were several for the encouragement of general botany. It consists of fellows and corresponding members: the former of whom pay an annual subscription of two guineas, or a composition of twenty guineas, in lieu of all contributions; the latter pay no subscription, but must reside out of England.

Gentlemen, desirous of becoming fellows, must signify their wishes to the secretary, who will lay the same before the council, when they will be ballotted for at the meeting following that at which they shall have been proposed. They have the privilege of attending and introducing one person to the lectures and meetings; and of inspecting the collections of specimens, the herbarium, and the library. All new medicines are submitted to the Society by its professors, who report their experiments and observations thereon.

The council look forward to be enabled to fit up a reading-room, museum, and laboratory, as soon as their funds will enable them to carry into effect such a desirable object. The Society meet every month throughout the year, except August and September, at the apartments formerly occupied by the Board of Agriculture, No. 32. Sackville Street, Piccadilly, where all communications are requested to be addressed. The Society are endeavouring to collect the medicinal plants of the several colonies, in order that gentlemen visiting them in a professional capacity, may inspect the same, and become acquainted with their characters previously to their departure. To encourage the labours of their members, the Society give annually a gold and silver medal for the best communications on medical botany. The President is Sir James M'Grigor, M.D. F.R.S. K.T.S., Director-General of the Army Medical Board; John Frost, Esq. F.S.A. M.R.I. F.L.S. H.S., is Director, and Professor of Botany; and Richard Morris, Esq. F.L.S., is Secretary. The number of members in all exceeds two hundred.

At a meeting of this Society in October last, 56 lbs. of the seed of *A*rgemòne mexicàna, a mild purgative, were presented by Mr. Higgins, of Nevis; and about 30 lbs. of the seed of *G*enísta tinctòria, from the Rev. Mr. Smirnovi. The last is a plant used by the Russians as a cure for hydrophobia.

The director, Mr. Frost, in his annual oration, commenced by showing the advantages derivable from the extended sphere of the Society, and its use to the medical officers of the army and navy. He then pointed out the salutary effects that would accrue from the regulations instituted by Sir James M'Grigor, Director-General of the Army Medical Board, relative to their studying botany.

A notice was read, offering a reward of 25*l.*, or a gold medal of equal value, for an accurate description of the plant yielding the myrrh, and which is merely *supposed* to be the produce of the *A'myris Kùtaf.*

April 11. A folio drawing, from Sir A. Johnson, of that curious vegetable production, the Pitcher plant, *N*epénthes (*ne*, negative, *penthos*, grief; supposed effects) distillatòria (*fig.* 43.), from the original drawing) was exhibited; and a collection of seeds presented by Mr. Morris, the secretary. The Pitcher plant is a native of Ceylon, Amboyna, Madagascar, and various places in Asia and South America. It is so called from the pitcher-like termination of the radical leaves. These leaves and stalks are highly vascular, and the pitchers are so large as to hold two ounces or more of clear water each, which is distilled into them through the stalks. According to Rumphius, the water is the habitation of a small shrimp; and, if so, the fact is wonderful. A communication was read on two species of Melaleùca, and a variety of elegant plants exhibited. It was announced that on May 9. Mr. Frost, the director, and professor of botany, would deliver a lecture on the genus *L*aùrus and its properties.

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Scientific Institutions. — A new feature in the metropolis is the practice of holding evening parties at the principal literary and scientific institutions, and at some of these ladies may attend. Various objects of interest are displayed throughout the largest apartments, which objects are either named or explained by affixed cards, or, if articles manufactured for sale, by some one interested in them. Frequently, also, some object or topic is explained or discussed scientifically to the surrounding group, and occasionally a lecture is delivered to the whole company. Tea and coffee, with other refreshments, are on a side-table. In the course of the two last winters, various meetings of this sort have been held at the Royal, London, and other Institutions, and at the College of Surgeons, which were numerously attended, and proved highly gratifying to all parties.

At the *London Institution*, on the evening of April the 16th, the *conversazione* contained a considerable portion of the mind of the city of London. The company began to assemble about 7 o'clock; and entering the library, upwards of fifty different objects in the arts, natural history, antiquities, and literary productions or curiosities, placed on tables, or suspended from the book-cases, attracted their attention. About 8 o'clock the doors of the theatre were thrown open, and, soon after, about 500 persons, perhaps one fifteenth of whom were ladies, heard a discourse by E. W. Brayley, jun., on the circular or quinary arrangement, as existing in the animal kingdom, particularly with respect to birds. Mr. Brayley began by some observations on the difference between a natural and an artificial system in natural history, stating that, in the latter, some particular character of the subjects of classification was selected, to form the basis of an arbitrary arrangement, the design of which was so to assemble them, as to aid the memory in the retention of their distinctive characters: but in a natural system, or an attempt to describe the mutual relations between natural objects as they actually appear to exist in nature, the aggregate of the characters, and their variation, are taken as the foundations of the arrangement. Mr. Brayley then proceeded to a brief view of the history of the quinary distribution of animals, and of the circular succession of affinities among them. They were discovered, he stated, by Mr. W. S. Macleay, an eminent entomologist, at present his Majesty's Commissioner of Arbitration at the Havannah, who published, in the year 1819, a work entitled *Hòræ Entomológicæ,* in which he sketched out a view of what appeared to him to be the natural arrangement of the animal kingdom in general, and that of the sub-kingdom, Annulòsa, in particular. A few years subsequently, a paper by Mr. Vigors, now secretary of the Zoological Society, was published in the 14th volume of the *Transactions of the Linnean Society,* in which a similar natural arrangement was demonstrated to pervade the feathered creation. This arrangement Mr. Brayley proceeded to explain, by means of some large diagrams, and of paintings and specimens of the various groups of birds. The first ramification of the class of birds is into five orders: Raptòres, or birds of prey; Insessòres, or perching birds; Rasòres, or gallinaceous birds; Grallatòres, or wading birds; and Natatòres, or web-footed birds. Four of these answer respectively to the Linnean orders, *A*ccipítres, *G*allìnæ, Grállæ, and *A*′nseres; the Insessòres consisting of the *P*ìcæ and *P*ásseres united, as the most eminent naturalists have shown they really are, in nature. Intermediate groups of birds connect these orders into a complete series returning into itself, or a complete circular succession; and each order consists of five minor groups, also forming a circular series, connected together in a corresponding manner, by intermediate or osculant groups. After explaining the characters of the principal groups, Mr. Brayley stated, that all the information he had offered respecting the natural arrangement of birds, had been derived from Mr. Vigors's publications; and he concluded with a warm tribute to the zeal and disinterestedness displayed by that gentleman in the promotion of zoological science, and especially in the concerns of the Zoological Society.

Mr. Sweet's Aviary, Cameron Square, Chelsea.— Mr. Sweet, having turned his attention to taming and keeping the musical genus Sýlvia, has, by diligent observation and appropriate management, actually changed most species of this family from annual to perennial songsters. I visited his collection in March last, and saw, with surprise, his interesting choristers, and heard from them the familiar strains of midsummer. A little room with a fire-place serves as an aviary; in this there are two large cages, which contain the nightingale, white-throat, lesser white-throat, pettichaps, wheat-ear, whin-chat, stone-chat, redstart, black-cap, willow-wren, and some other birds.

All these beautiful emigrants live healthily and happily together, partake of nearly the same kind of food, sing in season and out of season, and, in this artificial captivity, even gain new powers of song, and new social propensities. Some time back, an old whin-chat adopted for his own, fed, and nursed up a nest of young redstarts; and Mr. Sweet is of opinion, that any or all of them may be so treated as to breed in such aviaries. Their whole history, treatment, &c., is particularly interesting, and is fully detailed in Mr. Sweet's work, *The British Warblers,* with coloured plates, recently published.

I know not a more interesting amusement than an aviary of such songsters. Their appearance, in a suitably large and warm apartment, gives no idea of cruel imprisonment. Paired, as they may be, and ranging among living plants, as myrtle and orange trees, in or under which they will build and breed, they present no scene of pitiable infringement of liberty, nor of suffering captivity. On the contrary, to see them on a wintry day, " while the storm rises in the blackened east," all comfortably joyous, and safe from the chilling blast, gives a sensation of the purest satisfaction to the benevolent heart, while their songs of gladness sound like those of grateful thanks to their kind protectors. — *J. M. April.*

The Ornithological Results of Captain Franklin's last Expedition are now drawing up by Dr. Richardson, assisted by Mr. Swainson. The work will be a very perfect one, and with numerous plates and wood-cuts. The drawings of the quadrupeds will be done by T. Landseer, and those of the birds and vignettes by Mr. Swainson.

Among the *Ornithological Novelties* that have recently come from Mexico, are skins of the Ramphástus carinàtus, or Yellow-breasted Toucan. This bird was well known to Edwards, who figured and described it with tolerable accuracy. It seems, however, that from some cause or other, no ornithologist since that period had ever seen the species; and it consequently remained excluded from all the systems. Not long ago Mr. Swainson accidentally discovered the bill mixed up with other items at an auction. By comparing this with Edwards's account, and with a drawing in his own possession, this indefatigable zoologist clearly established its characters; and published a figure and description of the species in his third volume of *Zoological Illustrations* by the name of Ramphástos carinàtus. Yet as no other testimony could be brought forward, and no specimen existed in Europe, there was reason to believe, until its recent discovery in Mexico, that the species, like the Dodo, had become extinct.

Art. III. *Natural History in the English Counties.*

Botanical Museum of Cambridge. — The foundation of a Botanical Museum and Library was laid by Professor John Martyn, and these were subsequently augmented by Professor Thomas Martyn. For several years the Herbarium had been consigned to a damp cupboard, and when it came under the care of Professor Henslow, in 1825, was found to have suffered considerably. Not half of the specimens were in a sufficiently perfect state to be worth retaining. Such as appeared worth preserving have now been washed with a solution of corrosive sublimate, and stuck upon paper, together with whatever memoranda accompanied each specimen. The library consisted of about 300 volumes, chiefly of the earlier writers on botany, and may be considered as a useful and valuable depository of such works and early editions as still serve to illustrate the progress of this science, though now seldom consulted for the purposes of private study.

The senate having passed a grace during the last year (1827), for allowing an annual stipend for supporting and increasing this museum, there need be no apprehensions of any further neglect in this department; and Professor Henslow therefore ventures to solicit the assistance of his botanical friends in procuring materials for supplying the following collections, which he has commenced: —

1. Herbarium of the plants of Cambridgeshire.
2. Herbarium of the plants of Great Britain.
3. Herbarium for a general collection.

   N.B. — All local and rare specimens will be acceptable for the two first collections, and any natives, exotics, or cultivated specimens for the third. It is requested, where possible, that the exact habitat, *distinctly written,* and the time at which each specimen was gathered, may accompany it.

4. Dried lichens, fungi, &c., which have not been submitted to pressure.
5. Succulent fruits, fungi, &c., in spirits of wine or pickle.

6. Dried fruits, seeds, woods, gums, or any other miscellaneous articles, fossil as well as recent, which may tend to illustrate the science.

Professor Henslow has added the *A*lthæ'a hirsùta, from Kent, to the collection of British plants. Although this species is not mentioned in the *English Flòra*, nor figured in the *English Botany*, it had been previously detected and recorded as British in Symmon's *Synópsis*, and thence inserted into Turner and Dillwyn's *Guide*, and Hull's *Flòra*. It grows plentifully in several cultivated fields about the point of junction of the three parishes of Cobham, Cuxton, and Strood, flowering throughout July. — *J. S. H. Cambridge, April.*

At Cambridge the zeal for Natural History is daily on the increase in the university. Professor Henslow holds a natural history party every Friday evening at his own house, which is numerously attended by the friends of the science. — *J. W. Cambridge, March* 25.

Scabiòsa arvénsis. — Sir J. E. Smith says of this plant, that it is reported to be sometimes smooth, with all the leaves undivided, but that this has not been seen in England. I found it answering this description, on the 5th of August, 1825, in the Isle of Wight. — *E. K. April*, 1827.

Serrátula tinctòria. — In Sowerby's *Botany* it is observed that this plant is said to have been seen with white flowers. The *English Flòra* does not mention the white variety. In a small wood near Dulwich, in August, 1827, I found it in abundance, both with white and with purple flowers. — *Id.*

Scílla nùtans. — In a part of Combe Wood, where the trees had been recently felled, I found three specimens of this plant, with white flowers, in 1827. — *Id.*

Polemònium cærùleum. — Sir J. E. Smith observes that this plant is sometimes seen with white flowers. I have frequently seen them change from blue to white, and watched the gradual progress, unattended, at the time, with any appearance of decay. — *Id.*

Localities (or what botanists call habitats) *of rare British Plants.* — The following plants being not very commonly met with in the neighbourhood of London, your readers may be well pleased to know where to find them. *O*rnithógalum umbellàtum may be found in plenty on the point of land adjoining Teddington Lock, and by the river side in that neighbourhood. *A*nchùsa sempervìrens may be found in a hedge on the right hand, near to Ham House, in going from the river towards Ham Street. *A*'ster *T*ripòlium, usually found by the sea-coast, I gathered, in 1824, on the banks of the Thames, a little above high-water mark, on the way between Richmond and Kew. — *Id.*

A root of the Mandrake, *M*andrágora officinàlis, of the extraordinary length of 3 ft. and weighing 10 lbs., was lately dug up, in removing the ruins of an ancient edifice at Brighton. As the mandrake is not indigenous, and as there has been no garden in the field where it grew for many ages, the plant is presumed to have stood there for several centuries, probably since the demolishing of monastic buildings by Henry VIII., at which time the root of the mandrake was held in high estimation by credulous persons. The mandrake is generally believed to be the *dudaim* of the ancient Hebrews, and the plant which was so coveted by Rachel. (*Brighton Herald.*) We think this root much more likely to be that of the common white bryony, *B*ryònia álba. — *Cond.*

A Woodcock's Nest, with four eggs in it, is now in Chicksand woods, near Shefford, in Bedfordshire. The eggs are about the size of a bantam hen's, are of a bluish white ground, with irregular brown spots. (*Essex Herald*, April. 15.)

Rare Birds shot in the neighbourhood of Newcastle, in January last:— A fine specimen of the least woodpecker, *P*ícus mìnor *Lin.*, which is, perhaps, the only specimen known to be British; a particularly fine specimen of the Grey Phalarope, *le Phalarope à festons dentelés*, Buff.; a specimen of the Tippet Grebe, Colŷmbus urinàtor *Lin.*; and the Tufted Duck, *le petit Morillon*, Briss. Several rare birds were seen about Sunderland at the same time. (*Tyne Mercury.*)

A black Hare was lately shot at Combe, near Coventry. (*Morn. Chron*, Feb.)

Art. IV. *Natural History in Scotland.*

Wernerian Natural History Society. — Meetings were held on January the 12th and 26th, and February the 9th, and some interesting papers read; one by Dr. Grant on the anatomy of Peramèles nasùta, a rare marsupial animal from New Holland; a notice of the Cursòrius isabellìnus, or Swift-foot, a rare bird, having been seen in Leicestershire; and another notice respecting the Oüistiti, which the secretary, Mr. Neill, has kindly transmitted to us. In some future Number we hope to give a short history of this Society.

Edinburgh Botanic Garden, March, 1828. — Among the rare plants which have flowered here during the last three months are — *Æ*ginèt*ia* capitàta, *R*ubiàceæ, a herbaceous climbing plant, from Rio Janeiro; Artocárpus integrifòlia, the Entire-leaved Bread-fruit tree, produced several spadices of male flowers, but none of female flowers; Dodonæ*a* attenuàta, *T*erebintàceæ, a shrub from New South Wales; Heterópteris fúlgens, Malpighi*àceæ*, a climbing stove shrub, the native country of which is unknown; Lobèl*ia* racemòsa, from the West Indies; *M*éntha pùmila, from Nepal; Prímula verticillàta. (*Jam. Jour.*, April, p. 394.)

New Localities of rare Plants. — Erióphorum pubéscens is found in abundance in a boggy field three miles north of Berwick; Rhodìola *r*òsea on Fast Castle, and on rocks near Berwick; and *S*cílla vérna plentifully on the sea banks at Gun's Green, near Eyemouth. (*Jam. Journ.*, April, p. 404.)

The Sago Palm. — *C*ŷcas (name given by the ancients to a little palm which grew in Ethiopia) revolùta is now in flower in the garden of Cally, near Gatehouse, Kirkudbrightshire. The same plant flowered in the stove at Cally for the first time in June, 1826; it has been at Cally upwards of thirty years, and measures in circumference at the tips of the leaves 27 ft. The spike, or cone, it produced in 1826 measured 10 ft. in height, and appears to have been the male flower. — *J. N. Cally Gardens, March* 14.

Large Eagle. — A very fine eagle was entrapped last week by Captain Ramsay's game-keeper, on the hills above Balnakettle, in Kincardineshire. This magnificent bird measures 7 ft. 2 in. between the tips of the wings, and weighs 10½lbs.; that part of his leg commonly called the drumstick, is larger than a man can grasp with his hand. He is not at all injured by the trap, having been caught by one of the toes, and has been placed in a large cage, to keep company with another fine bird of the same species, which was taken from the nest in the Clova hills, about four years ago, and is not inferior in beauty of plumage, and not much inferior in size. (*Edinburgh Courant*, Feb.)

A Halibut, 3 ft. 6 in. in breadth, 7 ft. 6 in. in length, and weighing 320 lbs., was taken, off the Isle of Man, and brought to Edinburgh fish-market on April the 5th, being the largest of that species ever seen there. (*Scotsman*, April 9.) This fish, the Pleuronéctes hippoglóssus *Linn.*, belongs to the same family as the turbot. It inhabits the European and North American seas, and is the largest of all aquatic animals except the whale tribe, frequently weighing 400 lbs. The body is mucous, with oblong scales sticking firmly to the skin, which is liver-coloured above and white beneath. The flesh is fat and coarse, except the part which adheres to the side fins.

Art. V. *Natural History in Ireland.*

Belfast Botanic and Horticultural Garden. — A number of gentlemen of Belfast, and its vicinity, have formed a committee for establishing a garden; they have already purchased fourteen acres within a mile of Belfast. The objects are, a delightful place of resort; the cultivation of botanical science; a superior style of gardening; and the improvement of agriculture. The garden will be the property of holders of shares of five guineas each. Annual subscribers, of half a guinea each, shall have free access to the garden; and, with that liberal hospitality characteristic of the country, the greatest facility is to be given to the admission of strangers.

The Belfast Natural History Society, of the origin and progress of which we hope soon to give some account, hold their anniversary, and publish a report for the past year, on the 24th of May, the birth-day of Linnæus. An interesting memoir of Mr. Templeton, a well known botanist, was read last year by the President, and will be found in our biography in a succeeding Number. The report, among other things, states that the members of the Society are increased to sixty-seven. No very large addition has been made to the collection of minerals; but some exchanges have been effected, and others are contemplated, by which the different suites will be rendered more complete, and better adapted to illustrate this department of natural science. A collection of native birds was commenced towards the close of last session, to which several valuable specimens have been lately added; and it is to be expected that still larger additions will soon be made to this interesting part of the collection.

Some of the members who direct their attention principally to entomology have, for some time, been engaged in forming a collection of native insects, particularly of those found in the immediate neighbourhood; and preparations are now making for receiving them into the museum.

Various additions have been made to the *Hórtus Síccus,* and we may soon look forward to having a complete collection of the indigenous plants of Ireland. An interchange of specimens, too, has been commenced with America, by means of which the museum will be enriched with the vegetable productions of that extensive continent.

Some valuable exotics were lately received, which it is the intention of the members to present to the Botanical Society; and thus, as should always be the case, one scientific institution will lend its aid to the furtherance of the plans of another. The connections already formed by the Natural History Society will empower them occasionally to procure seeds and plants from various quarters; and the garden of the Botanical Society will enable the Natural History Society to cultivate, to greater advantage, the study of one of the most attractive branches of natural history.

The views of this Society are not confined to the formation of a museum, consisting, exclusively, of specimens of botany, mineralogy, or zoology. Every thing which can illustrate the history or antiquities of Ireland is willingly received; and the object embraces every thing interesting, as connected with the arts and sciences, or the history of man. Besides some Irish antiquities, a few coins have been lately received, which it is hoped will form the commencement of an interesting collection in this department.

During last summer excursions were occasionally made, by individual members, to different parts of the adjoining country; and plants, minerals, and insects collected, to illustrate the natural history of the various districts. Extra papers, founded on notes taken on those occasions, have been read, and materials are thus gradually accumulating, which may form the ground-work of more extensive statistical surveys. A series of meteorological observations were also made, at the request of the Royal Irish Academy.

Various donations of books have been received during the present session; and the library, with very little assistance from the funds of the Society, has thus been gradually increased.

By referring to the analysis book, it appears that twenty-nine papers have been read during the present session. Of these, two were on botany, eleven on mineralogy, three on topography, besides several local communications not noticed among the analyses, and thirteen on the different branches of zoology. By comparing this number with that read last session, there appears an increase of five, which can only arise from a greater number of extra papers. This is the best proof, if proof were required, of the increased interest members now take in the affairs of the Society.

In looking over the list of donations presented during the last year, we are struck by the variety of countries whence they have been received. We find the productions of the arctic regions in the next line to those of the tropics, the crystals of Iceland beside the minerals of Peru. Science seems to have power to annihilate distance, and to make the antipodes hold converse with each other; for, besides many specimens of plants, minerals, and subjects of zoology, presented from different parts of Ireland and England, donations have been received from Ceylon, Iceland, the Mediterranean, the West Indies, Mexico, Peru, the Cape of Good Hope, St. Michael's, Lapland, and Antigua.

From all these circumstances, from the gradual but constant progress of the Society during the present session, from the increase of its numbers, from the additions to its library, and from the enlargement of its museum, the curators feel confident of its future utility and advancement.

The Juvenile Natural History Society of Belfast is, we believe, one of the first societies of the kind that has ever been instituted. The general idea is excellent, and we hope soon to give such particulars as will lead to the formation of similar societies in other large towns. Dr. Drummond, in speaking of this Society in his anniversary address, says, "the Juvenile Natural History Society has wisely received your countenance and assistance; and in the young gentlemen who compose it, you naturally look forward to future members to supply the places of those of us whose exertions cannot be much longer expected."

Art. VI. *Perennial Calendar for various Parts of Europe.*

By a calendar of nature is to be understood a record of the times at which certain annual or other changes take place in animals, plants, some minerals, and the weather. The uses of such a calendar for any given situation, or for different stations throughout a country or division of the globe, are various. To the cultivator it indicates more correctly than can be done by the artificial measurements of time, the best periods for sowing and planting, felling timber, gathering crops, destroying insects, &c.; to the agriculturist it offers various suggestions in regard to the management of animals as well as of hay, corn, and other field crops; to the valetudinarian, the tourist, or the retiring citizen in quest of a situation for a country residence, it offers a choice of weather and climate; and, to the meteorologist, a variety of views and general conclusions, some of which are seen or foreseen, and others will be the result of future conclusions from the facts which we and others are putting on record.

After considering the plans of the calendars of nature, which have been published by White, Stillingfleet, Aikin, and especially by Dr. Forster, we have arrived at the conclusion, that the way to render such a calendar most generally useful, is to confine the indications to a limited number of animals and plants, and to let these animals and plants be of the same species in all the different stations where the observations are to be made. We have made a selection below for every month in the year, and we intend to print it in the form of a letter, and to send copies to a certain number of stations in Britain and on the Continent, in order to get the blanks filled up, and the letters returned to us at the end of every year. We propose that the calendar shall commence from January next, and we intend the stations to be as follows: —

In England and Wales. — * London, Canterbury, Salisbury, Exeter, Plymouth, * Penzance, Bristol, Swansea, Milford Haven, Holyhead, Chester, Carlisle, Berwick, Newcastle, Durham, Hull, Lincoln, Yarmouth, Norwich, Ipswich, * Bungay, Cambridge, Oxford, Birmingham, Shrewsbury, Derby, York, * Worcester, * Hereford, Broomsgrove, Kendall, and Hexham.

In Scotland. — * Haddington, * Edinburgh, Dundee, Aberdeen, Inverness, Thurso, * Kirkwall, Ullapool, Stornaway, Benbecula, Rum, Fortwilliam, Kilbride, Inverary, Stirling, Dunkeld, * Annat Gardens near Perth, Falkirk, Lanark, and Dumfries.

In Ireland. — * Belfast, Londonderry, Enniskillen, Ballinrobe, Galway, Limerick, * Cork, Cashel, Wexford, Mullingar, and Dublin.

On the Continent. — * Paris, Bourdeaux, Marseilles, Nice, Milan, Florence, Rome, * Naples, Geneva, Bolwiller, Vienna, Dresden, * Berlin, Hamburgh, Brussels, Leyden, Amsterdam, Copenhagen, Dantzic, * Warsaw, Moscow, * Petersburgh, and Stockholm.

We shall be glad to add other places to this list, as the greater the number of points, so much the more useful will be the information. We know of individuals who will undertake the calendar at the places marked (*), and we should be glad of offers for the remainder or for places near them, and for any other places that may be the residences of persons friendly to the pursuits of natural history and to this Magazine. We are also desirous of receiving such remarks and criticisms as may occur to the reader, on the choice of places and plants, so as to profit by them, and improve the lists before printing them for distribution. We shall therefore not print them for three months to come. We shall send them to their destinations in November next; and, on receiving them in January, 1830, filled up, we shall then present them in a tabular form, and so compressed as to occupy only a page or two. In January, 1831, on receiving the lists for 1830, we shall arrange them in like manner, and so on yearly. At the ends of stated periods of years, say 7, 14, 21, &c., averages will be given, in order, as much as possible, to generalise the information obtained. If any correspondent can suggest any more useful plan, or any improvement on this plan, we shall feel exceedingly obliged to him.

It may be necessary to premise, that in order to fill up the blanks under meteorology, a daily register will require to be kept of the thermometer, taken about nine o'clock in the morning; of the barometer, taken about the same time; of the rain, taken, every three or four days; and of the other particulars daily, after the day has passed.

Skeleton Calendar for the Magazine of Natural History, as kept at , in the of , being in latitude and longitude , distant from the sea about miles, and nearly feet above the level thereof: the soil being , on a subsoil of . By Mr. .

Flora for January 18 . — The following plants flowered, viz., the sweet-scented coltsfoot on the , Christmas rose , winter aconite , barren strawberry , snowdrop , the hazel on the , and the *Pȳrus japónica L. Cydònia japónica Lind.*, on the .

Fauna. — Fieldfares and redwings remain on the , the early song of the following birds heard, viz., the common wren on the , the hedge-sparrow , the song-thrush , and the missel-thrush on the . The marsh titmouse begins his spring note on the , the nuthatch on the . Trout leave their spawning-places on the .

Meteorology. — Mean temperature of the month degrees, by Fahrenheit's scale; greatest variation from the mean, °; greatest heat, °; greatest cold, °; mean height of the barometer, ; greatest variation from the mean, °; greatest height, °; lowest extreme, °; number of fair days, ; number of rainy days, ; number of snowy days, ; quantity of rain, snow, &c. inches; prevailing winds from the , and ; temperature of main-spring water °.

Observations. —

The Calendar for the remaining months will be given in the next Number.

Art. VII. *Calendar of Nature for London.*

The object of this calendar is partly as a record of facts for future use and gratification, and partly as a standard of climate, weather, and natural appearances, with which naturalists in different parts of the country may compare their own situations. The objects shall not be numerous, and we shall in future always commence with those contained in the corresponding months of the Perennial Calendar (p. 87.) — *Cond.*

A generally mild autumn was succeeded by an equally mild and unconfirmed winter. Several of our early song birds, as the thrush, the hedge-sparrow, and common wren, were frequently heard before the first of January. Before this day, too, natural primroses appeared in Covent Garden Market. The new year was ushered in by wet yet warm weather; wind generally from S.S.W., and occasionally veering to the W. and N.W., at which times the clouds cleared off, and night frosts followed. Snow fell on the 5th; on the 11th a heavy fall, with an east wind; also on the 16th, but which did not lie.

The equinoctial gales set in on the 18th of March, and continued moderately till the 25th, when the weather became more settled. The dust flew in London streets on the 4th of the same month, when the water-carts were in requisition. A blue mist on the 15th of March, and several misty mornings about the same time.

In the gardens, early flowers soon showed themselves; viz., hellebore, aconite, groundsel, snowdrops, &c. &c. The almond came in flower on the 3d of March, and gooseberries on the 18th.

First summer birds, the chiff-chaff and black-cap, arrived about the 8th, the nightingale, willow-wren, redstart, and lesser field-lark about the 14th.

The lowest temperature by Fahrenheit was on the morning of the 26th of March, when the mercury indicated 25° at 7 A.M.; the highest point was 52°, on the morning of the 12th instant at the same hour.

On the whole, the season thus far has been a changeable though moderate one, and the year promises to be a favourable one for the fruits of the earth. — *J. M. April* 20.

Art. VIII. *Indicatorial Calendar.*

Under this article it is not our intention to point out all the remarkable natural occurrences which may be expected in the ensuing two months, but merely a few of the leading features, in order to direct to them the attention of young observers of nature. — *Cond.*

The *weather* during May and June is usually the most pleasant of the whole year; the air is peculiarly soft and refreshing, being scented with the balmy fragrance of innumerable flowers and opening buds. Almost every part of the vegetable creation is in vigorous growth, and holding forth the pleasing hope of future perfection. The ear is ever saluted by the concert of the groves, and all nature seems to rejoice. The winds are generally variable, in which case there are alternations of showers and sunshine; if steady from any of the northerly points, with a clear sky, frosty air sometimes chills the early hours, and checks the tender shoots. Changeable weather having continued for the last three months, it is probable it will continue four or six weeks longer.

Quadrupeds. — Moles are affected by the season; though the constant tenants of darkness, their economy in forming their abodes, and exertions in search of their food, arrest the notice of the observer. In the beginning of May, the female begins to prepare a nest, either under a bush or hedge, and not uncommonly in the open pastures, by throwing up a larger hill than usual. The water shrew may be seen diving in search of food amongst the mud in spring water ditches.

The Fishes which appear in the London market in May and June, are chiefly the salmon, turbot, mackerel, doree, red mullet, and pike. The doree (corrupted from *adorée*, worshipped, or probably from *dorée*, gilt; in allusion to its splendid colour) Zèus Fàber *Lin.*, (*fig.* 44.) is said by some to be the fish out of whose mouth St. Peter took the tribute-money, leaving on its sides those incontestible proofs of the identity of the fish, the marks of his finger and thumb. Others contend that the fish in question was the haddock. It is rather hard to determine the dispute; for the doree also asserts an origin of its spots of a similar nature, but of a much later date than the former. St. Christopher, in wading through an arm of the sea, having caught a fish of the kind, *en passant*, as an eternal memorial of the fact, left the impression on its sides to be transmitted to all posterity. In our own country it was very long before the fish attracted notice, at least as an edible one. We are indebted to that judicious actor and *bon vivant*, the late Mr. Quin, for adding a most delicious luxury to our table, who, overcoming all the vulgar prejudices on account of its deformity, has effectually established its reputation. It is found on the southern shores of this kingdom. Those of the largest size are taken in the Bay of Biscay, and in the Mediterranean. Ovid has called it *rarus Faber*, which must have been owing to its excellence, not its scarcity. While living, the colour is very resplendent, and as if gilt, whence, according to some, the name; but Sir Joseph Banks used to say it should be *adorée*, and that it was the most valuable of fish, because it required no sauce. The red mullet, or surmullet, *Múllus* Surmulètus *Lin.*, (*fig.* 45.) was highly esteemed by the Romans, and bore an exceedingly high price. The ca-

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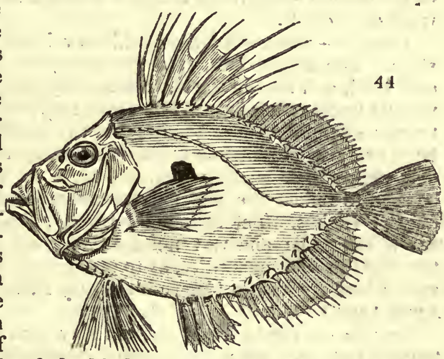

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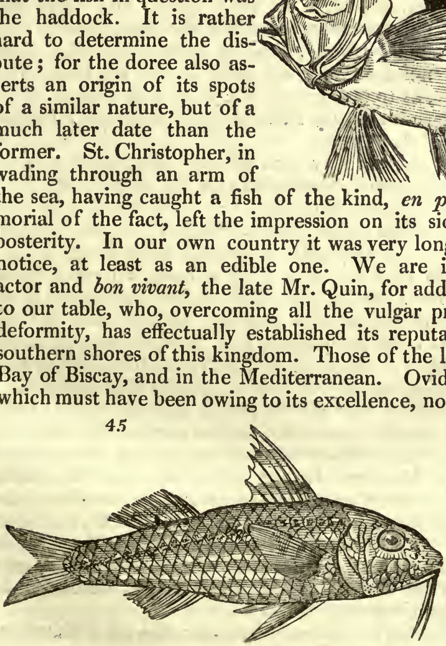

pricious epicures of the days of Horace, valued it in proportion to its size: not that the larger fish were more delicious, but that they were more difficult to be got. Evidence of the high price and the luxury of the age, appears from Juvenal: —

——— "Mullum sex millibus emit,
Æquantem sane paribus sestertia libris."

——— "The lavish slave
Six thousand pieces for a mullet gave,
A sesterce for each pound."

But Apicius, a man of consular dignity, gave a still more unconscionable sum, for he did not scruple bestowing 8000 *nummi*, or 64*l.* 11*s.* 8*d.*, for a fish of as small a size as the mullet. (See *Pennant.*)

Birds. — Before the middle of May all our summer birds will have arrived. The turtle-dove and fly-catcher are generally the two last. Throughout the two coming months, all the singing birds (those that are constantly with us, as well as temporary visitors) may be heard or seen. It is their breeding season, after which, several of the emigrants which breed but once, leave us. The young of most birds appear; and the congregeting of those of the insectivorous tribes makes it difficult to distinguish the various kinds from each other.

Insects. — Swarms of these will now burst from their egg and chrysalis state. The dragon-flies leave the water, the element where they are born and bred, and soar in the air, where they may be seen darting after smaller winged insects, their prey. The gaudy family of butterflies, the mail-covered though splendid tribe of beetles, and the curiously mechanical fraternity of bees, every where intrude themselves on the notice of the naturalist. Spiders weave their geometric-formed webs on every spray; and which may be seen to reflect the prismatic colours, to entice the more readily their unwary victims. The common butterfly, *P*apílio chrysomèla álba, deposits a red fluid; and vast numbers of the insects in the air have dropt this fluid in such quantities, as to give rise to the story of a shower of red rain, which is given in Gassendi's *Life of Peirese*. (See *Brewster's Journal*, April, 1827.)

Reptiles. — Toads, frogs, and efts may soon be seen changing from their tadpole state to their perfect form. Soon after this, the frogs instinctively leave the water, and secrete themselves on land, to avoid the notice of their natural enemies, ducks, and other aquatic birds. Snakes cast their slough; and, with vipers and slow-worms, may be seen basking under hedges.

Worms. — The dew-worm may be seen lying abroad, on warm moist mornings, or during warm rain. Snails, with their curiously-coloured spiral shells, may be seen roving about in moist weather, accompanied by their shelless congeners, wherever moisture exists or their favourite food abounds. In shallow brooks, in still parts at the edge of the stream, the Górdius may be seen, like an animated hair, waving its slender body in all directions.

Plants. — The greatest variety and the brightest glow of Flora's train regale the senses in the two ensuing months. In the *garden*, the conspicuous pæony, the irises, and ranunculuses are only equalled by the splendid flowering shrubs of North America. In the *fields*, the harebell, stitchwort, and herb-robert may be seen under every hedge; in *meadows*, the cuckoo-flower, germander-speedwell, scorpion-grass, and above all, that interesting tribe of plants, the Orchídeæ, of which several sorts will appear in this season. In the *marshes* may be seen the butterwort, loosestrife, and sweet-gale; and, in *rivers*, the white and yellow water lilies, water ranunculuses, and many other aquatic plants.

Astronomical Indications.— Next to the sun and moon, the other planetary bodies are the most attractive to the eye; and, as some of your young readers may wish to be able to identify those splendid wanderers, I subjoin the following memoranda for May and June, which shows when the planets will be in conjunction with the moon.

May	4. at	6 A.M. Mars.	June	14. at	8 P.M. Saturn.
	12.	6 P.M. Mercury.		14.	10 P.M. Mercury.
	17.	9 P.M. Venus.		16.	5 A.M. Venus.
	18.	6 A.M. Saturn.		27.	9 A.M. Jupiter.
	27.	3 A.M. Jupiter.		27.	10 P.M. Mars.

Chelsea, April 21. J. M.

Art. IX. *Biography.*

Death of Sir J. E. Smith, President of the Linnean Society.— On Monday, March 17. at his house in Norwich, aged sixty-eight, died the distinguished naturalist, Sir James Edward Smith, M.D. F.R.S., Member of the Academies of Stockholm, Upsal, Turin, Lisbon, Philadelphia, New York, &c. &c.; the Imperial Acad. Naturæ Curios., and the Royal Academy of Sciences at Paris; Honorary Member of the Horticultural Society of London, and forty years President of the Linnean Society.

Born at Norwich, Dec. 2. 1759, where he received his education; went to Edinburgh, in 1780, having previously devoted himself to the study of natural history, and botany in particular. During his medical studies at that university, he so far distinguished himself as a botanist, as to obtain the gold medal given to the best proficient among the students in that science.

Upon leaving Edinburgh, and going to London to perfect his professional studies, he became acquainted with Sir Joseph Banks, that eminent patron of natural science and of all its ardent admirers; upon whose recommendation he purchased, in 1784, "*the celebrated Linnean collection,*" comprising the epistolary correspondence of the great Linneus and his son, together with every thing that belonged to those eminent men, relating to natural history or medicine.

From that period, the life of Mr. Smith was devoted to a zealous cultivation of the science of natural history; and his numerous works will constitute a perpetual monument of that fame which no living author more duly merited or more justly obtained.

Having purchased the Linnean collection, and settled in London as an acknowledged man of science, in the year 1786 he graduated as a physician at Leyden. In that and the following year he visited most of the classical and celebrated places of France and Italy. The account of these travels was published in 1793, under the title of *A Sketch of a Tour on the Continent*, in 3 vols. 8vo; a work which at once raised the subject of our memoir into the first class of literary society.

Upon his return to London, Dr. Smith (in conjunction with his lately deceased and highly valued friend, Dr. Goodenough, Lord Bishop of Carlisle, who was one of the original vice-presidents, and Thomas Marsham, Esq., who became Treasurer) set about establishing the Linnean Society, of which Dr. Smith was the original president, and to which distinguished office he was annually and unanimously chosen from that period to the present time.

The first meeting was held April 8. 1788, when "an introductory discourse on the rise and progress of natural history," was read by the President. This forms the first article of the *Transactions of the Linnean Society;* a work which has already extended to fourteen or fifteen quarto volumes.

In 1792 Dr. Smith was invited to give some instruction in his favourite science of botany to the Queen and Princesses, at their rural and elegant retreat at Frogmore, near Windsor; and how well he was calculated for such an appointment, those who have derived delight and improvement from his lectures at the Royal Institution, at Liverpool, at Bristol, &c., can amply attest.

In 1796 Dr. Smith was married to the only daughter of the late Robert Reeve, Esq., of Lowestoft, Suffolk.

In the following year he retired from London to reside in his native city; and, with occasional visits to the metropolis, where he had a very numerous circle of scientific friends, as well as an extensive acquaintance in the highest ranks of society, to whom he was warmly attached, and by whom he was reciprocally esteemed, Norwich became his constant residence.

In 1814 Dr. Smith received the honour of knighthood at the hands of His present Majesty, who was then Prince Regent, and who had graciously condescended to become Patron of the Linnean Society.

The Horticultural Society was pleased to enroll the name of Sir James Edward Smith as one of its honorary members, in conjunction with those of His late Royal Highness the Duke of York and Albany, His Royal Highness the Prince Leopold of Saxe Coburg, and Sir Humphrey Davy, LL.D. &c., late president of the Royal Society.

The health of Sir James Edward Smith had been for some time declining; but following the even tenor of his scientific pursuits, and blessed with every comfort that a congenial union can afford, his time glided on without the slightest relaxation of ardour in his botanical labours, while his latest and even his unfinished works, attest that there was no diminution either of his zeal or his success, in affording both information and satisfaction to those who were proud to look up to him as one of the first botanists of the age.

In 1824, on occasion of the establishment of a museum of natural history in Norwich, through the exertions of a few admirers of the science, Sir James Edward Smith kindly lent the weight of his name in furthering this object, and condescended to become president of that institution.

Although none of his friends could be altogether unprepared for the melancholy event, still the decease of Sir James Edward Smith was somewhat sudden. The feebleness of his frame seemed to have in some degree recovered a little of its former tone during the last week of his existence, so that he was enabled to pursue his accustomed labours, and even to enjoy the exercise of taking a walk without any great fatigue.

He was attacked, however, on Saturday, March 15., with such an alarming degree of debility as almost immediately to extinguish the hopes of his recovery. Under this attack he gradually sunk, till, at about six o'clock A.M. of Monday, March 17., he placidly resigned his breath, and "his spirit returned to him who gave it."

Among the numerous works of which Sir James Edward Smith was the author, it may be sufficient here to mention one or two, perhaps, besides his *Tour*, as those upon which his fame was in a great measure reared, and upon which it may be said to be permanently established.

Of these *English Botany* is entitled to the first consideration, as containing a description and a coloured figure of every plant known to be indigenous. This work consists of thirty-six octavo volumes, and contains 2592 figures of British plants.

It is a curious but a melancholy coincidence, that on the very day he entered his library for the last time, the packet containing the fourth volume of his *English Flora* reached him; and he had the gratification of witnessing the completion of a work, upon which his friends have frequently heard him express an opinion that it was the one which would eventually redound most to the estimation of his knowledge as a botanist and his credit as an author.

A pretty correct estimate of Sir James Edward Smith's benevolent views of the power and wisdom of the God of nature, (and he had a most perfect and consolatory conviction of the truth of Divine Revelation,) may be given with great propriety in his own words, at the conclusion of the preface to the work last mentioned: — "He who feeds the sparrows, and clothes the golden lily of the fields in a splendour beyond that of Solomon himself, invites us, his rational creatures, to confide in his promises of eternal life. — The simple blade of grass, and the grain of corn, to which he gives its own body, are sufficient to convince us that our trust cannot be in vain. Let those who hope to inherit these promises, and those who love science for its own sake, cherish the same benevolent dispositions. Envy and rivalship, in one case, are no less censurable than bigotry and uncharitableness in the other. The former are as incompatible with the love of nature as the latter are with the love of God, and they altogether unfit us for the enjoyments of happiness here or hereafter." — *T.*

Art. X. *Queries and Answers.*

Putting Bees in Mourning.—I should not have mentioned the following circumstance, but I own I feel a curiosity to know if the same superstition prevails in any other part of the kingdom. A person, in Norfolk, to whom I was talking about bees, told me that where they were kept it was peremptory, in case of the death of any of the family, to put the bees in mourning, or the consequence would be that all of them would die. He followed up this assertion by giving me a case in point, where, from the neglect of the custom, every bee in the apiary had perished. The method of putting them in mourning is by attaching a piece of black cloth to each of the hives!! — *Daniel Stock. Bungay, Suffolk, April* 1. 1828.

The Shrieke, Lànius (*lanius,* a butcher) excùbitor (*excubitor,* a watcher).— Can you or any of your readers inform me if this bird seizes its prey with its feet or its bill? — *A. B.*

The following answer to this query we obtained from Mr. Audubon. — *Cond.*

The Shrieke, Lànius excùbitor *Lin.*, when pouncing on its prey, seizes it with its bill first (if insectivorous), then secures it under its feet to eat it. The same bird, when coming on a bird or a mouse which it has pursued for some distance, *settles its feet at the moment that it strikes with its bill on the cranium of the object* pursued. I have seen a bird of this kind, in America, carried to a very considerable distance by a Carolina dove, fastened to the back and the head of the dove with beak and feet. And although the toes are slender, and the claws comparatively weak, their pressure is powerful, and the bite it inflicts with the bill can draw blood from a robust man's finger in an instant. — *J. J. A. 95. Great Russell Street, April* 10. 1828.

M*ỳa batàva.*— Are any of your readers possessed of British specimens of the true *M*ỳa batàva of Maton and Turton, (the *U*'nio batàva of Lamarck,) and can they point out its locality? I have never seen native examples of this shell, which is common in France and other parts of the Continent. I purchased a specimen from Mrs. Mawe, which she told me came from Gibraltar. — *S. C.*

Ground Grubs. — Sir, I think you would render entomology much more useful to people in general than it now is, if you gave us short descriptions and outline figures of all the ground grubs, which, under various names, do so much damage to the farmer and the gardener. The names by which they are called are so various, and so contradictory, that I really do not know what is the true wire-worm. A grub which has long done me much damage, and which I thought was the wire-worm, a neighbour tells me is the white worm or ver blanc of your *Gardener's Magazine.* How are we to know, if scientific entomologists will not condescend to think for us? — *A. B.*

Latreille's Natural System of Animals. — Will you, or any of your readers, inform me in what respect Latreille's system differs from that of Cuvier, and what relation both systems bear to what are called the circular, binary, quinary, and septenary systems, of which we hear so much by modern naturalists? — *Alexander Simson. York Street, Covent Garden, April* 10.

In our succeeding Number, the first of a series of papers on zoology will be given; introductory to which the above and other systems of arrangement will be discussed. — *Cond.*

Art. XI. *Retrospective Criticism.*

The Eagle and the Hawk. — Sir, In the vignette of your Prospectus (otherwise very prettily and correctly designed) you have given a figure, intended, I presume, for an eagle; but allow me to hint that it has much of the hawk aspect about it, and, in short, that it is a compound of both. The bills of all eagles are more or less lengthened at the base; that is, they form a straight line towards the nostrils, and then suddenly curve as they approach the end, where they bend into a strong hook. (*fig.* 46. *a.*) The bills of hawks (*b*) and falcons (*c*), on the contrary, are very much shorter, and the curve, instead of commencing at about half the length of the bill, begins, as in the figure in your vignette, at the very base. These characters and differences in the bill mainly serve to distinguish the two divisions of rapacious birds placed by Linnæus in the genus Fálco, and known in the days of falconry by the terms *noble* and *ignoble*. The noble falcons are those which seize their prey in the air during flight; for they never devour what has been killed or wounded by other birds; they must drink the blood of their victims warm, or not at all. In all these birds the bill is very short, strong, and much hooked. Cuvier, and other French reformers, have made numerous sub-genera of such as vary more or less in the shape and form of the bill and wings; but, as I am not acquainted with the foreign species, I shall only notice those which occur in Britain. Of these noble falcons we have two races: the first, which in point of fact, are the *most noble*, are such as have the upper mandible of the bill provided with a strong and sharp tooth (*fig.* 46. *b*), used, most probably, for the more expeditious tearing of their prey; the wings, too, are very long; often, indeed, exceeding the tail, and the second feather is always the longest. In both these characteristics, swiftness and rapacity are strongly indicated. To this tribe belong the restrel or stannel, the merlin, the hobby, and the peregrine falcon. The last of these, from its docility and courage, seems to have been the favourite among falconers. The second race of falcons are inferior to the first in many respects; the tooth of their bills is rounded off, and does not present an acute angle; while the wings are proportionably short, and consequently weaker. Our only native example of these birds (which are the true hawks) is the sparrow-hawk Between these two races stands the Hièro Fálco of Cuvier, known in this country by the name of the Iceland falcon. I have never met this bird in any of my shooting

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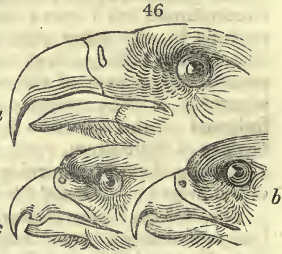


excursions, and shall be very glad if some of your correspondents could give me, through your Journal, some intimation of its manners and habits. It is described by Cuvier as having the blunt-toothed bill of the hawk, and the long wings of the true falcons already noticed. It is therefore considered by some as a connecting link between them; while it is placed by Cuvier intermediate between the Nóbiles, and the second grand division of rapacious birds, called Ignóbiles, from their being seldom, if ever, used in falconry. Under this title come the buzzards, kites, and eagles. All these agree in having the bill provided only with a slight festoon, instead of a tooth, and in the fourth feather of the wings being the longest. They either dart or fall upon their prey, and do not seize it, like the noble birds, by chase; they may be called, indeed, poachers, while the true falcons are legitimate hunters. Most of these ignoble birds will devour any animal that comes in their way, as rats, mice, snails, slugs, beetles, &c., and will, if pressed for food, even devour carrion. Buzzards are known by the great length of their wings, their even tail, and their small head and bill. Our native species are: — 1. The Hen-harrier; 2. Honey Buzzard; 3. Common Buzzard; 4. Rough-legged Buzzard; and, 5. Moor Buzzard. The kites are not much unlike the buzzards, but have been separated from them on account of their long forked tail. One species only is found with us, and which is well known. The last tribe of ignoble birds are the eagles. It seems strange that naturalists should differ so much from poets and historians, who, in every age, have given the opposite denomination to these birds. But this seems to have originated more in ignorance of their habits, when compared to the true falcons. Eagles are certainly among the largest birds, and eminent for great strength and powers of destruction. They may be compared to the race of giants among men, as described in the *Fairy Tales;* but we seldom read of these giants being at the same time brave, generous, or docile. On the contrary, poets describe them as treacherous, cowardly, and blood-thirsty; in short, just such a race as the eagles are among birds. They may be kept in confinement, and reared from the nest, but they are never tamed; and they will occasionally rob other more courageous hunters, of the spoil which they want either the bravery or activity to procure for themselves. Wilson, the delightful author of the *American Ornithology*, describes this trait in the character of the bald eagle, in the following glowing colours: — "Elevated on the high dead limb of some gigantic tree, he seems calmly to contemplate the motions of the feathered tribes below. High over all these, hovers one, whose action instantly arrests his attention; by his wide curvature of wing and sudden suspension in air, he knows him to be the fish-hawk, settling over some devoted victim of the deep. His eye kindles at the sight; and balancing himself with half open wings on the branch, he watches the result. Down, rapid as an arrow from heaven, descends the distant object of his attention, the roar of its wings reaching the ear as it disappears in the deep. At this moment the eager looks of the eagle are all ardour; and levelling his neck for flight, he sees the fish-hawk once more emerge, struggling with his prey, and mounting in the air with screams of exultation. These are the signal for our hero, who, launching into the air, instantly gives chase, soon gains on the fish-hawk; each exerts his utmost to mount above the other, displaying in these rencontres the most elegant and sublime aërial evolutions. The unencumbered eagle rapidly advances, and is just on the point of reaching his opponent, when with a sudden scream, probably of despair and honest execration, the latter drops his fish. The eagle, poising himself for a moment, as if to take a more certain aim, descends like a whirlwind, snatches it in his grasp ere it reaches the water, and bears his ill-gotten booty silently away to the woods." In proof, however, of the innate cowardice of this formidable robber, the same author adds, — "When driven, as he sometimes is, by the combined courage of the fish-hawks, from their neighbourhood, and forced to hunt for himself, he retires more inland, in search of young pigs, of which he destroys great numbers. He will also attack old sickly sheep, aiming furiously at their eyes."

The above extract is so interesting, that I have transcribed it without abridgment, particularly as the great expense of the work will naturally prevent it from being in the hands of many of your readers. Our Natural History Society here fortunately possess a copy. To conclude, the species of eagles inhabiting Great Britain appear still to be imperfectly understood. The bald eagle, or white-tailed eagle, above mentioned (Fálco leucocéphalus *Lin.*), seems to be the adult of the sea-eagle of Pennant, as the ring-tailed is of the golden eagle (F. chrysàëtos *Lin.*). The fishing eagle, alluded to by Wilson, is likewise found in Britain. I am, Sir, yours, &c.

Manchester, March 20. 1828. Z. B.

The vignette to which Z. B. alludes was that of our first Prospectus, in which the trees, as well as the eagle's head, were not very correct. Our present vignette will be found considerably improved in both these particulars. — *Cond.*

Art. XII. *Commercial Notices.*

Exchange of Shells. — Sir, I take the first advantage of your well projected Magazine of Natural History, to propose an exchange with some of your conchological readers. My cabinet is deficient in the following species of A'nodon, for which I shall be happy to give, in exchange, the duplicates of some very fine Uniònes, I have just received from America.

A'nodon rugòsus, *Swainson's Zoological Illustrations*, vol. ii. pl. 96.
A'nodon purpuràscens, *Ibid.* vol. iii. pl. 160.
A'nodon cràssus, *Ibid.* vol. iii. pl. 167.
A'nodon elongàtus, *Ibid.* vol. iii. pl. 176.
Anodónta exótica, *Lamarck's Anim.*, vol. vi. p. 87.
Anodónta patagónica, *Ibid.* p. 88.

Birmingham, April. S. C.

Brookesian Museum. — The zootomical collection of Joshua Brookes, Esq. F. R. S. &c., the celebrated anatomist, will be sold by auction about the middle of May, unless previously purchased by private contract. Catalogues are generally published of such collections, to give an idea of their contents; but so much does that of Mr. Brookes exceed all others that we remember in extent and number, that even the prodromus, or forerunner of the catalogue, is a pamphlet of twenty pages. The catalogue itself will be published as speedily as possible, arranged, like the prodromus, according to the circular form.

A Collection of Shells and Minerals, of considerable interest, though hitherto little known to the public, will soon be exposed for sale by Mr. Sowerby, the author of *The Genera of Shells*, &c. (p. 56.)

Lectures on the Universe, including a general view of every department of natural history, will be delivered in the course of the summer by Mr E. Donovan, F. L. S. M. W. S. &c. &c., author of various works on fishes, birds, &c.

Private Lessons on Botany are given by Miss Kent, the elegant authoress of *Flòra Doméstica* and *Sylvan Sketches*, of whose taste and talents in her department, an article in a succeeding Number will bear ample testimony.

THE MAGAZINE

OF

NATURAL HISTORY.

JULY, 1828.

Art. I. *The Cuvierian, or Natural, System of Zoology.*

Essay 1. *On the distinctive Characters of Vegetables and Animals, and the leading Physiological Characters which serve as the Basis for the Four Grand Divisions of the Animal Kingdom.* By B.

The excellence of the Cuvierian system of zoology, as explained in the work entitled *Le Règne Animal*, consists in its being a natural system, founded on the organisation and the essential resemblances of living beings. It presents us with a chart of animal life, and shows us that all the varied forms and modes under which sentient creatures exist, are referable to four distinct forms, or models, and these forms are the foundation of the four grand divisions of the animal kingdom. Each of these forms, or models, without changing its essential characters, admits of different modifications, corresponding with the internal organisation, and thus a natural subdivision into classes is established; and on the same principle is made a farther subdivision of each class, into orders, genera, and species. To present the reader with a clear but concise view of this system, it will be necessary to select and state, in the first instance, the leading facts in animal physiology on which the grand divisions are founded.

The ancient division of organised living beings into *animate*, or those which possess feeling and spontaneous motion, and *inanimate*, or those which do not enjoy either of these faculties, is, according to Cuvier, sufficiently established; for, though many plants draw back their leaves when touched, and always direct them towards the light, and their roots towards moisture, and though oscillations take place in the parts of some vegetables, without any apparent external cause, yet these motions bear too slight a resemblance to those of animals, to afford proofs of perception or volition. The spontaneous motions of animals make essential modifications necessary in those organs, which may be regarded as simply vegetative. The parts which perform the functions of roots do not penetrate the ground, they are therefore obliged to have a power residing in themselves of gathering their aliments, and they must also carry within themselves the receptacle of these aliments. Hence arises the *first character* of animals, — *an intestinal cavity*, whence the nourishing juices penetrate the other parts, either by pores or by vessels, which may be regarded as *internal roots*. The organisation of the intestinal cavity, and of its appertenances, must naturally vary according to the nature of the aliments, and the operations they must undergo, before furnishing juices proper to be absorbed; whereas the atmosphere and the earth supply vegetables with juices already prepared for absorption. The body of an animal, having to perform functions more varied and numerous than those of a plant, consequently required a much more complicated organisation; its parts, also, being unable to preserve a fixed position in regard to each other, it was not possible for the regular motion of its fluids to be affected by external causes. This motion must be independent of temperature and the atmosphere; hence the necessity for the *second character* of animals, *a system of circulation*: but this is less essential than the digestive system, because it is not found in the most simple animals.

The functions of animals require organic systems that are not necessary in vegetables, — a system of muscles for voluntary motion, and a system of nerves for sensation. The chemical composition of the animal body is also more complicated than that of a plant, and there enters into it an additional essential elementary substance, *azote*, which in plants is only accidentally united with the three essential elements of their organic structure, — oxygen, hydrogen, and carbon. The *muscular and nervous systems*, and the *different composition of animal bodies*, form the *third character*.

The soil and the atmosphere present to vegetables, for their nutrition, water, which is composed of oxygen and hydrogen; and atmospheric air, which contains oxygen, azote, and carbonic acid: the latter is a combination of carbon and oxygen. To draw from these aliments their proper nourishment, it is necessary that plants should retain the hydrogen and the carbon, and that they should exhale the superfluous oxygen, and absorb little or none of the azote: such is the routine (*la marche*) of vegetable life, the essential function of which is the exhalation of oxygen; this is performed by the aid of light. The food of animals, either mediately * or directly, is derived from vegetables, in which hydrogen and carbon are the principal constituent parts. To reduce them to their proper composition, it is necessary that the excess of hydrogen, and more particularly of carbon, should be diminished, and that the quantity of azote should be increased ; this is effected, in respiration, by the oxygen of the atmosphere, which combines with the hydrogen and carbon of the blood, and is exhaled with them in the state of water, or carbonic acid. The azote, from whatever part it may enter the animal body, appears to remain there. The relations of vegetables and animals with the atmosphere are, therefore, the reverse of each other ; vegetables extract and decompose (*défont*) water and carbonic acid, animals reproduce them. Respiration is the function essential to the constitution of the animal body; it is what, in some manner, animates it, and we shall see, as we proceed, that the animal functions are more or less completely exerted, as the animals enjoy a more or less complete respiration; the difference in this respect forms the *fourth character of animals.*

The functions of the animal body are divided into two classes: 1st, The *animal functions*, or those peculiar to animals, which are sensibility and voluntary motion; 2d, The *vital or vegetative functions*, common to animals and vegetables, which are nutrition and generation. Sensibility resides in the nervous system. The most general of the external senses is the feeling; it resides in the membrane that covers the whole body, called the skin. Many animals are without ears or nostrils; several animals have no eyes; some are reduced to the single sense of feeling; but this sense is possessed by all animals. The impressions received by the external senses, are propagated by the nerves to the central masses of the nervous system, which, in the higher classes of animals, consist of a brain and spinal chord. In proportion as animals partake of a superior nature, the brain is larger, and sensation is more concentrated in this organ; and in proportion as they are placed lower in the scale, the medullary masses are dispersed. In the most imperfect genera the nervous substance appears to be entirely diffused in the general substance of the body. When an animal has received a sensation, and a volition is excited, it is by the nerves that this volition is transmitted to the muscles. The muscles are bundles (*faisceaux*) of fleshy fibres, whose contractions produce all the motions of the animal body. The number and direction of the muscles of every animal are

* Carnivorous animals prey on those which derive their food from the vegetable kingdom.

so disposed, as to perform the motions which it has to execute; and when these motions require great strength, the muscles are inserted into hard jointed parts, which may be regarded as levers. In vertebrated animals these parts are internal, and are formed of gelatine, penetrated by particles of phosphate of lime: they are called the bones. In the molluscous and crustaceous animals, and in insects, these parts are external, and are composed of lime or horny matter (*cornée*), which transudes between the skin and the epidermis: they are called shells, crusts, or scales. The fleshy fibres are inserted into the hard parts by means of other fibres, of a gelatinous nature, which appear to be a continuation of the muscles, and form what are called tendons.

The configuration of the surface of the joints of the bones, shells, or crusts of animals limits their motions, which are still farther restrained by ligaments attached to the sides of the joints. According to the different arrangement of the bony and muscular apparatus (*appareil*), and to the form and proportion of the members which result from thence, the animals are in a condition to perform the innumerable motions which take place in walking, leaping, flying, and swimming.

The muscular fibres concerned in digestion and circulation are not subject to the power of volition; nevertheless, they are furnished with nerves, the principal of which undergo subdivisions and enlargements (*renflemens*), that appear to be intended to withdraw these nerves from the power of volition. It is only when under the influence of the passions, or powerful emotions of the mind, that the empire of volition extends beyond these barriers, and it is always to disorder the vegetative functions. In a diseased state, likewise, these functions are attended with sensation. Most commonly the digestion goes on, without being perceived by the animal.

The aliments, after being divided by the teeth and jaws, or sucked in when the animal feeds on liquids, are swallowed by the muscular motions of the lower part of the mouth and the throat, and are deposited in the first part of the alimentary canal, which is commonly swelled out into one or more stomachs. There the food is penetrated by juices proper to dissolve it. As the food advances along the other parts of the alimentary canal, it receives other juices, to complete its preparation. The internal surface of the canal has pores, which extract from the alimentary mass the part which is suitable for nutrition; the useless residue is ejected as excrement.

In the lowest class of animals the intestine is in the form of a bag, without a vent, and the excrements are ejected by the mouth. The number of animals is more considerable in which the nourishing juices, absorbed by the coat of the intestines, are immediately spread through the whole spongy mass of the body (*la spongiosité du corps*); for this appears to be the case in the whole class of insects.

In some of the orders of *A*rachnides and of worms, the nourishing juices circulate in a system of closed vessels, the extreme ramifications of which distribute the molecules to the parts that are to be supported by them. The vessels which carry this nourishing fluid to the parts are called arteries; those which bring it back to the centre of circulation are called veins. The circulation is sometimes simple, and sometimes double, or even triple, reckoning that of the abdominal, or biliary, system. The rapidity of the circulation is often aided by the contraction of certain fleshy organs (*appareils*), which are called hearts, and are placed at one or other of the centres of circulation, and sometimes at both.

In vertebrated animals, with red blood, the nourishing fluid issuing from the intestines is white, and is called chyle; it is carried by particular vessels, called lacteals, into the venous system, where it is mixed with the blood. Vessels similar to the lacteals, and forming with them a system called the lymphatic, bring back into the venous blood the residue of the nutrition, and the products of cutaneous absorption.

In order that the blood may be rendered suitable for the nourishment of the parts, it is necessary that it should receive by respiration a certain modification from the ambient element.

In animals which have a system of circulation, a part of the vessels carry the blood into certain organs, where they subdivide it, and spread it over a great surface, that the action of the ambient element may be more powerful. When the element is air, the surface of the organs is cellular (*creuse*), and they are called the lungs; when the element is water, the surface of the organs is saliant, and they are called gills. There are always organs of motion, disposed in a manner to convey the ambient element either into, or upon, the respiratory organs.

In animals which have no circulation the air is spread upon all points of the body, by elastic vessels, called tràcheæ; or the water either penetrates the body through vessels, or only bathes the surface of the skin.

The blood which has undergone the process of respiration, is fit to repair the composition of all the parts, and to effect what is properly called nutrition. The facility with which the blood is decomposed in every point of the body, so as to leave there precisely the species of molecules which are requisite for it, is truly marvellous. It is this which constitutes the whole vegetative life.

For the nutrition of solids, we perceive no other arrangement than a minute subdivision of the last arterial branches; but for the production of liquids, the apparatus is more varied and more complicated. Sometimes these last extremities of the vessels expand simply over large surfaces, from whence the liquid to be produced exhales; sometimes the liquid exudes from the bottom of little cavities; more frequently the arterial extremities, before changing into veins, give rise to particular vessels, which carry (*transportent*) this liquid; and it is at the point of union of the two kinds of vessels that it appears to be formed. Thus the minute blood-vessels and these peculiar (*propres*) vessels *, by interlacing, form bodies called conglomerate, or secretory, glands.

In animals which have no circulation the nourishing fluid bathes all the parts, each part drawing from the fluid the molecules necessary for its support; if it be required that a peculiar liquid should be formed, proper vessels float in the nourishing fluid, and extract, by their pores, the elements necessary for the composition of this liquid.

Thus the blood constantly maintains the composition of all the parts, and repairs the alterations which are the continual and necessary consequence of their functions. The general ideas that we are able to form of these operations are sufficiently clear, although we have not distinct notions of what takes place in detail in each point; for want of knowing, with sufficient precision, the chemical composition of each part, we cannot give an exact account of the transmutations necessary for its production. There are, also, other glands, which separate from the blood certain liquids, that are either ejected as superfluous matter, as the urine from the kidneys, or are of some service to the animal, as the ink of the cuttle-fish, and the purple of some of the Mollúsca †, &c. The production of a germ, or generation, is an operation, or phenomenon, far more difficult to conceive than the secretions; we may regard it as almost incomprehensible; but when once the existence of the germ is admitted, the difficulty is removed. So long as the germ adheres to the mother, it is nourished, as if it were one of her organs; when once it is detached, it has itself individual life, which is essentially similar to that of the adult.

* To these vessels, which Cuvier calls proper, or peculiar, some physiologists have recently given the name of capillary vessels.

† The cuttle-fish, when pursued, ejects a black liquor, to darken the water, and hide itself from its enemies.

The germ, the embryo, the fœtus, the little new-born creature, are never perfectly of the same form as the adult, and the difference is sometimes so great, that their assimilation has obtained the name of a metamorphosis. No person could foresee, without previous experience or information, that a caterpillar would become a butterfly.

All living beings are metamorphosed more or less in the course of their growth; that is, they lose certain parts, and others are developed which were before inconsiderable. The anténnæ, the wings, and all the parts of the butterfly were before enclosed in the skin of the caterpillar; this skin disappears, with the jaws, the feet, and other organs which do not remain with the butterfly. The feet of the frog are enclosed in the skin of the tadpole, and the tadpole, to become a frog, loses its tail, its mouth, and its gills. Even the infant, at its birth, loses its placenta, and its surrounding membranes; at a certain age it acquires, by degrees, hair, teeth, and a beard; the relative size of the organs change, and its body enlarges more in proportion than the head.

The above selection of the most important facts in animal physiology, will serve to indicate the influential characters, which ought to serve as the bases for the first divisions of a zoological system. It is clear, says Cuvier, that these characters should be taken from the functions of sensation and motion; for these not only constitute the being an animal, but they establish, in some manner, the degree of its animalisation (*de son animalité*). Observation confirms this inference, and proves that the degree of developement and of complication of the animal functions, is in concordance with that of the organs of the vegetative functions. The heart, and the organs of circulation, are a species of centre for the vegetative functions, as the brain and trunk of the nervous system are for the animal functions. We shall see that these two systems diminish (*se dégrader*) or disappear together. In animals of the lowest class, where there are no visible nerves, there are no distinct fibres, and the organs of digestion are simply excavated in the homogeneousness of the body. The vascular system disappears even before the nervous system in insects; but, in general, the dispersion of the medullary masses corresponds with that of the muscular parts.

The correspondence of the general forms, which result from the arrangement of the motive organs, with the distribution of the nervous masses, and the energy of the circulating system, ought therefore to serve as a basis for the first divisions (*coupures*) to be made in the animal kingdom. We shall afterwards examine what characters ought immediately to succeed them, and form the first subdivisions.

In considering the animal kingdom according to the principles that have been stated, and setting aside the prejudices established by the divisions formerly received, if we regard only the organisation and the nature of animals, without reference to their size, their utility, or the more or less perfect knowledge we have of them, or any other incidental circumstances, we shall find that there are four principal forms, four general plans, if I may be allowed the expression, according to which all animals appear to have been modelled; and all the ulterior divisions, by whatever names they may have been decorated by naturalists, are only slight modifications, founded on the developement or addition of some parts, which do not change, in any respect, the essential parts of the plan.

In the first of these forms, which is that of man and the animals that resemble him the most, the brain and the principal trunk of the nervous system are enclosed in a bony envelope, which forms the skull and the vértebræ; to the sides of this vertebral column are attached the ribs and the bones of the members, that form the framework (*charpente*) of the body. The muscles generally cover the bones, which they move, and the víscera * (*les viscères*) are enclosed in the head and the trunk of the body.

Animals of this form we call VERTEBRATED ANIMALS (*Animàlia vertebràta*). They have all red blood, a muscular heart, and a mouth, with two horizontal jaws; distinct organs of sight, of hearing, of taste, and smell, are placed in the cavities of the face. Vertebrated animals have never more than four limbs (*membres*), the sexes are always separated, they have all nearly the same distribution of the medullary masses, and of the principal branches of the nervous system.

In examining closely all the parts of this great division, we shall find some analogy even in species the most remote from each other, and we can trace the gradations of the same plan, in a descending series, from man to the lowest genus of fishes.

In the second form there is no skeleton; the muscles are only attached to the skin, which forms a soft envelope that is contractile in every direction. In many species the skin produces stony coverings called shells, the position and extent of which are analogous to those of the mucous body. The víscera and the nervous system are included in the general

* Víscera, in common language, is applied generally to the intestines; in a scientific acceptation, víscus *singular,* víscera *plural,* may denote any internal organ or organs.

envelope. The nervous system is composed of many distinct masses, united by nervous threads, the principal of these are placed near the œsóphagus, and have received the name of the brain. In animals of this division we can only distinguish the organs of two senses, which are those of taste and sight. One single family only exhibits organs of hearing. The system of circulation is, however, complete, and there are particular organs for respiration. The organs of digestion and secretion are nearly as complicated as those of vertebrated animals.

The animals of this second form are called MOLLUSCOUS ANIMALS (*Animàlia mollúsca*). Although the plan of their organisation, with respect to the external configuration of the parts, may not be so uniform as that of vertebrated animals, there is always a resemblance between these parts, at least of the same degree, in the structure and in the functions. The cuttle-fish, and animals with univalve or bivalve shells, belong to this division.

The third form is that which is observed in insects, worms, &c. In animals of this division the nervous system consists of two long chords, ranging along the belly, and swelling out at intervals into ganglions or knots. The first of these knots, placed near the œsóphagus, is called the brain; it is but little larger than the rest. The envelope of the trunk is divided by transverse folds into a certain number of rings, the coverings of which are sometimes hard, and sometimes soft, but the muscles are always attached to them beneath. The trunk has often articulated members, or legs, on each side, but is frequently without them. The animals of this form we call ARTICULATED ANIMALS (*Animàlia articulàta*).

In the animals of this division we first observe the passage from circulation in a vascular system to nutrition by imbibition, and a corresponding passage from respiration in circumscribed organs to that in air-vessels called tràcheæ, which are spread over the whole body. The organs of taste and sight are the most distinct in the animals belonging to this division; one single family, only, exhibits organs of hearing. The jaws are always lateral.

The fourth form, which comprises all the animals known under the name of zoophytes, may be called RADIATED ANIMALS (*Animàlia radiàta*).

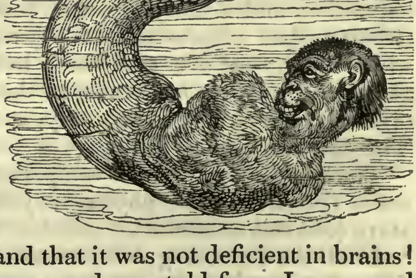
In all the preceding divisions the organs of sense and motion are placed symmetrically, on the two sides of an axis; in the animals of this fourth division they are placed circularly, round a centre. Many radiated animals approach in substance to the homogeneity of plants, they exhibit no distinct nervous system, nor organs of the particular senses; in some of them we scarcely perceive any traces of circulation; their organs of respiration are almost always on the surface of the body; in the greater number the whole intestine consists of a bag without a vent; and in the lowest families the bodies are a kind of homogeneous pulp, possessing a certain degree of mobility and sensation. The next essay will contain the principal parts of Cuvier's chapter on the intellectual functions of animals, and some farther observations on organisation, before we give his more complete description of the characters of vertebrated animals, and their subdivision into four classes.

(*To be continued.*)

Art. II. *The Tests by which a real Mermaid may be discovered.* By Conchilla.

Sir,

I venture to address you upon a subject which has at various times interested the ingenious, and not a little puzzled philosophers themselves; I mean the tests by which a real mermaid may be discovered; if, indeed, there is such an animal at all. I am led into these reflections by having lately visited one of the principal cities in Holland, in the museum of which I was shown one of these wonderful creatures; of this, from memory, I have made a slight sketch. (*fig.* 47.) It was in a glass case, and about 3 ft. in length. The face, head, and breast were like those of a monkey of the orang-outang kind; but it had no arms, and, from the middle downwards, it resembled a fish. I asked some questions concerning it, and was informed that its inward conformation down to the middle resembled that of a human being; that, like an honest creature, it had its heart in the right place; that its lungs were excellent; and that it was not deficient in brains! I asked from whence it came, and was told from Japan; and I could not help replying, after I had spent some time in its examination, that, if it had been presented as an artificial instead of a natural curiosity, it would have been worthy of



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admiration, but that, as it was, I conceived it to be an unworthy imposition. My reasons are deduced from the following considerations: — And to speak, first, as to what concerns the perfection of its lungs; fishes, with the small exception afforded by the cetaceous class, being, according to the best authorities, devoid of hearing, are also denied a voice; for, in creatures who could not converse with each other, this would indeed have been an incongruous superfluity. How, then, came this singular inhabitant of the great deep to be thus wonderfully endowed with organs of which it could never make any use? If, too, as it appears from its being so rarely seen, its place is at the bottom of the sea, how could a creature, with a conformation of the lungs resembling our own, live and breathe there, when there is nothing better authenticated, than that the most expert and practised divers are unable to stay at the bottom of the sea more than half an hour? But supposing it, for argument's sake, belonging to the class of fishes to which I have adverted, it is a well attested fact, that they are not able to remain under the water for more than two or three minutes together, before they rise to its surface, in order to take in a new inspiration; and is it possible that this animal should be so rarely seen, if this were the case? Further, every inhabitant of the waters carries on its motions through them by means of its fins, as birds do theirs through the air by their wings; and, to be entirely equipped, two pair of fins and three single ones appear necessary to the former, though one pair of wings is sufficient for all the wants of the latter. Of these the pectoral fins, which are placed near the gills, act like oars, and serve to impel the animal forward; they likewise keep the head from descending too much into the water, or from being too much above it. The ventral fins are nearer the tail, and seem chiefly useful in balancing the fish in the water; and of the single fins it may be observed, that the dorsal fin and the anal one, which are on the ridge of the back, serve, in some degree, all these purposes, while the tail answers to all intents the purpose of a rudder. This, as I said before, is the perfect complement of a fish in the way of fins; nevertheless, there are many not, in this way, so perfectly endowed, because some peculiarity in their conformation, would render so great a number of fins superfluous, if not, indeed, retarding to them. For instance, the form of the *M*uræ̀na, or eel, being so entirely equal, requires little balance either one way or the other, it is, therefore, entirely destitute of ventral fins; and the Gymnòtus (*gymnos*, naked, *nōtos*, back), or *Carapo*, having the back broad and flat, would rather be rendered unsteady if it were in possession of a dorsal fin. Some fishes, also, have no tail fin. But what shall we say to a fish of above three feet in length, which has no fin but that; which has, as one may say, a broad chest and a heavy head, without any one contrivance to keep it from being, at all times, lower than any other part of its body? It might, indeed, be inferred, that so extraordinary a creature would live in an extraordinary manner; and certainly no manner could be more extraordinary, than that of living with its head downwards, and its tail in the opposite extreme! But this must be impossible under these points of view; and, I am apt to believe, that if all mermaids were tried by one or other, or all, of these tests, they would be found equally imaginary. Yes, Sir, I cannot help thinking, that in such cases we are not less deceived than our ancestors were, though it may be less agreeably; for their mermaids sang, and combed their sunny locks, and were, besides, extremely personable monsters, while ours are not only altogether mute, but as ugly as can be well conceived. If, then, Mr. Editor, we must be in error, pray give us your potent assistance to fall back into our earlier and more poetical absurdities; but if to come at the truth is a more desirable thing still, and if you find that my communication tends at all to that end, I shall be happy to see among your other contributions this of CONCHILLA.

ART. III. *Anecdotes of a tamed Panther.* By Mrs. BOWDICH.

Sir,

ON perusing the First Number of the Magazine of Natural History, I find that you admit zoological anecdotes. I am, therefore, induced to send you some account of a panther which was in my possession for several months. He and another were found when very young in the forest, apparently deserted by their mother. They were taken to the king of Ashantee, in whose palace they lived several weeks, when my hero, being much larger than his companion, suffocated him in a fit of romping, and was then sent to Mr. Hutchison, the resident left by Mr. Bowdich at Coomassie. This gentleman, observing that the animal was very docile, took pains to tame him, and in a great measure succeeded. When he was about a year old, Mr. Hutchison returned to Cape Coast, and had him led through the country by a chain, occasionally letting him loose when eating was going forward, when he would sit by his master's side, and receive his share with comparative gentleness. Once or twice he purloined a fowl, but easily gave it up to Mr. Hutchison, on being allowed a portion of something else. The day of his arrival he was placed in a small court, leading to the private rooms of the governor, and after dinner was led by a thin cord into the room, where he received our salutations with some degree of roughness, but with perfect good-humour. On the least encouragement he laid his paws upon our shoulders, rubbed his head upon us, and his teeth and claws having been filed, there was no danger of tearing our clothes. He was kept in the above court for a week or two, and evinced no ferocity, except when one of the servants tried to pull his food from him; he then caught the offender by the leg, and tore out a piece of flesh, but he never seemed to owe him any ill-will afterwards. He one morning broke his cord, and, the cry being given, the castle gates were shut, and a chase commenced. After leading his pursuers two or three times round the ramparts, and knocking over a few children by bouncing against them, he suffered himself to be caught, and led quietly back to his quarters, under one of the guns of the fortress.

By degrees the fear of him subsided, and orders having been given to the sentinels to prevent his escape through the gates, he was left at liberty to go where he pleased, and a boy was appointed to prevent him from intruding into the apartments of the officers. His keeper, however, generally passed his watch in sleeping; and Saï, as the panther was called, after the royal giver, roamed at large. On one occasion he found his servant sitting on the step of the door, upright, but fast asleep, when he lifted his paw, gave him a blow on the side of the head which laid him flat, and then stood wagging his tail, as if enjoying the mischief he had committed. He became exceedingly attached to the governor, and followed him every-where like a dog. His favourite station was at a window of the sitting-room, which overlooked the whole town; there, standing on his hind legs, his fore paws resting on the ledge of the window, and his chin laid between them, he appeared to amuse himself with what was passing beneath. The children also stood with him at the window; and one day, finding his presence an incumbrance, and that they could not get their chairs close, they used their united efforts to pull him down by the tail. He one morning missed the governor, who was settling a dispute in the hall, and who, being surrounded by black people, was hidden from the view of his favourite. Saï wandered with a dejected look to various parts of the fortress in search of him; and, while absent on this errand, the audience ceased, the governor returned to his private rooms, and seated himself at a table to write. Presently he heard a heavy step coming up the stairs, and, raising his eyes to the open door, he beheld Saï. At that moment he gave himself up for lost, for Saï immediately sprang from the door on to his neck. Instead, however, of devouring him, he laid his head close to the governor's, rubbed his cheek upon his shoulder, wagged his tail, and tried to evince his happiness. Occasionally, however, the panther caused a little alarm to the other inmates of the castle, and the poor woman who swept the floors, or, to speak technically, the *pra-pra* woman, was made ill by her fright. She was one day sweeping the boards of the great hall with a short broom, and in an attitude nearly approaching to all-fours, and Saï, who was hidden under one of the sofas, suddenly leaped upon her back, where he stood in triumph. She screamed so violently as to summon the other servants, but they, seeing the panther, as they thought, in the act of swallowing her, one and all scampered off as quickly as possible; nor was she released till the governor, who heard the noise, came to her assistance. Strangers were naturally uncomfortable when they saw so powerful a beast at perfect liberty, and many were the ridiculous scenes which took place, they not liking to own their alarm, yet perfectly unable to retain their composure in his presence.

This interesting animal was well fed twice every day, but never given any thing with life in it. He stood about 2 ft. high, and was of a dark yellow colour, thickly spotted with black rosettes, and from the good feeding and the care taken to clean him, his skin shone like silk. The expression of his countenance was very animated and good-tempered, and he was particularly gentle to children; he would lie down on the mats by their side when they slept, and even the infant shared his caresses, and remained unhurt. During the period of his residence at Cape Coast, I was much occupied by making arrangements for my departure from Africa, but generally visited my future companion every day, and we in consequence became great friends before we sailed. He was conveyed on board the vessel in a large wooden cage, thickly barred in the front with iron. Even this confinement was not deemed a sufficient protection by the canoe men *, who were so alarmed at taking him from the shore to the vessel, that, in their confusion, they dropped cage and all into the sea. For a few minutes I gave up my poor panther as lost, but some

* The panther in these countries is a sacred, or Fetish, animal; and not only a heavy fine is extorted from those who kill one, but the Fetish is supposed to revenge his death by cursing the offender.

sailors jumped into a boat belonging to the vessel, and dragged him out in safety. The beast himself seemed completely subdued by his ducking, and as no one dared to open his cage to dry it, he rolled himself up in one corner, nor roused himself till after an interval of some days, when he recognised my voice. When I first spoke, he raised his head, held it on one side, then on the other, to listen; and wheu I came fully into his view, he jumped on his legs, and appeared frantic; he rolled himself over and over, he howled, he opened his enormous jaws and cried, and seemed as if he would have torn his cage to pieces. However, as his violence subsided, he contented himself with thrusting his paws and nose through the bars of the cage, to receive my caresses. I suspect that he had suffered from sea sickness, as he had apparently loathed all food; but, after this period, he eat every thing that was given to him.

The greatest treat I could bestow upon my favourite was lavender water. Mr. Hutchison had told me that, on the way from Ashantee, he drew a scented handkerchief from his pocket, which was immediately seized on by the panther, who reduced it to atoms; nor could he venture to open a bottle of perfume when the animal was near, he was so eager to enjoy it. I indulged him twice a week by making a cup of stiff paper, pouring a little lavender water into it, and giving it to him through the bars of his cage: he would drag it to him with great eagerness, roll himself over it, nor rest till the smell had evaporated. By this I taught him to put out his paws without showing his nails, always refusing the lavender water till he had drawn them back again; and in a short time, he never, on any occasion, protruded his claws when offering me his paw.

We lay eight weeks in the river Gaboon, where he had plenty of excellent food, but was never suffered to leave his cage, on account of the deck being always filled with black strangers, to whom he had a very decided aversion, although he was perfectly reconciled to white people. His indignation, however, was constantly excited by the pigs, when they were suffered to run past his cage; and the sight of one of the monkeys put him in a complete fury. While at anchor in the before-mentioned river, an orang-outang (*Símia Sátyrus*) was brought for sale, and lived three days on board; and I shall never forget the uncontrollable rage of the one, or the agony of the other, at this meeting. The orang was about 3 ft. high, and very powerful in proportion to his size; so that when he fled with extraordinary rapidity from the panther to the further end of the deck, neither men nor things remained upright when they opposed his progress: there he took refuge in a sail, and although generally obedient to the voice of his master, force was necessary to make him quit the shelter of its folds. As to the panther, his back rose in an arch, his tail was elevated and perfectly stiff, his eyes flashed, and, as he howled, he showed his huge teeth; then, as if forgetting the bars before him, he tried to spring on the orang, to tear him to atoms. It was long before he recovered his tranquillity; day and night he appeared to be on the listen; and the approach of a large monkey we had on board, or the intrusion of a black man, brought a return of his agitation.

We at length sailed for England, with an ample supply of provisions; but, unhappily, we were boarded by pirates during the voyage, and nearly reduced to starvation. My panther must have perished had it not been for a collection of more than three hundred parrots with which we sailed from the river, and which died very fast while we were in the north-west trades. Saï's allowance was one per diem, but this was so scanty a pittance that he became ravenous, and had not patience to pick all the feathers off before he commenced his meal. The consequence was that he became very ill, and refused even this small quantity of food. Those around tried to persuade me that he suffered from the colder climate; but his dry nose and paws convinced me that he was feverish, and I had him taken out of his cage; when, instead of jumping about and enjoying his liberty, he lay down, and rested his head upon my feet. I then made him three pills, each containing two grains of calomel. The boy who had the charge of him, and who was much attached to him, held his jaws open, and I pushed the medicine down his throat. Early the next morning I went to visit my patient, and found his guard sleeping in the cage with him; and having administered a further dose to the invalid, I had the satisfaction of seeing him perfectly cured by the evening. On the arrival of the vessel in the London Docks, Saï was taken ashore, and presented to the Duchess of York, who placed him in Exeter Change, to be taken care of, till she herself went to Oatlands. He remained there for some weeks, and was suffered to roam about the greater part of the day without any restraint. On the morning previous to the Duchess's departure from town, she went to visit her new pet, played with him, and admired his healthy appearance and gentle deportment. In the evening, when Her Royal Highness's coachman went to take him away, he was dead, in consequence of an inflammation on his lungs.

I am, Sir, &c.

S. Bowdich.

ART. IV. *Some Account of a particular Variety of Bull* (Bós Taúrus), *now exhibiting in London.* By Mrs. HARVEY.

Sir,

AGREEABLY to your request, Mr. Harvey has taken a portrait of this animal; and, as he has made the drawing on the wood himself, the engraving will be a very perfect resemblance. (*fig.* 48.) I have on my part drawn up the following particulars from what my husband told me, and I shall be happy if they prove of any interest to you or your readers.

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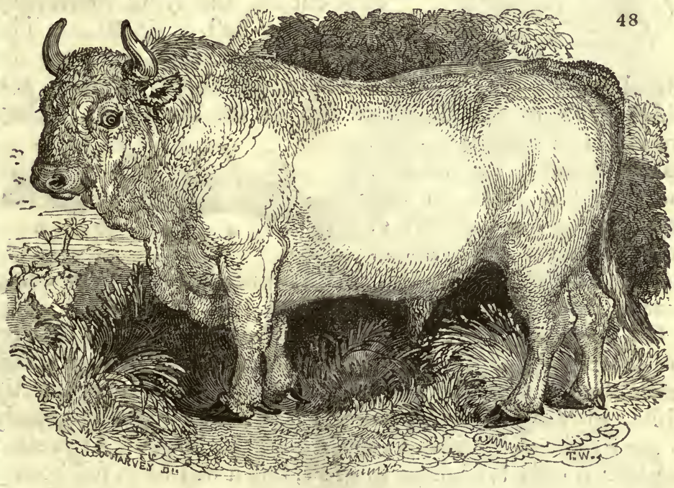

This animal belongs to a Frenchwoman, who says he was brought from Africa to Bourdeaux when a calf; and, after having been shown in different parts of the Continent, was taken to London, and exhibited at the Grand Bazaar in King Street, Portman Square, last autumn. He is at present five years old, 4 ft. high at the shoulder, and 7 ft. in length, from the horns to the insertion of the tail. The length of his face is 1 ft. 8 in., and the girth round the collar 7 ft. 6 in. His hair is short and silky, and the colour a cream or yellowish white, except two black tufts which appear on each foot. On the back of the neck there is a hump or swelling, which seems confined to this variety. The general aspect of the animal is mild and docile; but, when irritated, his expression is very remarkable, exhibiting itself principally in the eye. This, in its ordinary state (*fig.* 49.), is very peculiar, rising more than one half above the orbit, and bearing a resemblance to a cup and ball, thus enabling the animal to see on all sides with equal ease. The iris is naturally of a pale blue colour; but, when the animal is irritated, it varies from a very pale blue or lilac, to a deep crimson. Its form is also very remarkable, being a small oval, or rather a parallelogram, with the ends cut off, and lying tranversely across the ball. (*fig.* 50.) The black tufts mentioned above are the lateral hoofs (*fig.* 51.), which the animal sheds annually, and which grow to the length of five or six inches (*a*). They are not shed together, or at stated periods; for those of the fore feet (*a b*), in this example, are at present of different ages, and, consequently, of different lengths, the difference between them being exactly that represented in the sketch.

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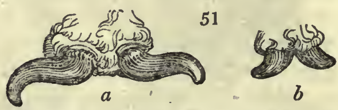
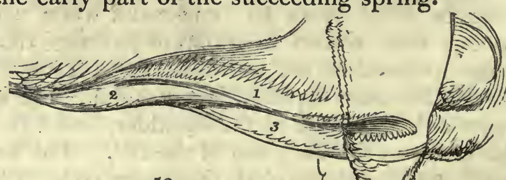


On the hump, or collar, the hair grows much longer than on the other parts of the body, forming a sort of curled mane, resembling, I should imagine, that of the bison. It is perfectly white, growing to the length of 1 ft. 6 in., and adding greatly to the height of the rising part behind the horns. At present the hair is only beginning to grow, but it will be in full beauty at the approach of the winter months, and will fall off gradually again in the early part of the succeeding spring.

The keeper pointed out to Mr. Harvey, as a remarkable peculiarity, that the dewlap (*fig.* 52.), in passing between the fore legs (*a*), and under the body (*b*), seemed to divide itself into three parts, which they called the three stomachs (1, 2, 3), from their being very much acted on in the progress of digestion. I remain, Sir, &c.



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M. Harvey.

Portland Terrace, Regent's Park,
May, 1828.

Art. V. *Notes on the Bird of Washington* (*Fálco Washingtoniàna*), *or Great American Sea Eagle.* (*fig.* 53.) By John James Audubon, Esq. F.L.S. F.R.S.E. &c.

It was on a winter's evening, in the month of February, 1814, that, for the first time in my life, I had an opportunity of seeing this rare and noble bird, and never shall I forget the delight it gave me. Not even Herschell when he discovered the famous planet which bears his name could have experienced more happy feelings. To have something new to relate, to become yourself a contributor to science, must excite the proudest emotions of the human heart.

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We were on a trading voyage, ascending the Upper Mississippi, — the keen winter blasts whistled over our heads, and the cold from which I suffered had, in a great degree, extinguished the deep interest which, at other seasons, this river has been wont to awake in me. I lay stretched beside our patroon; the safety of the cargo was forgotten, and the only thing that called forth my attention was the multitude of ducks, of different species, accompanied by vast flocks of swans, which from time to time would pass us. My patroon, a Canadian, had been engaged many years in the fur trade; he was a man of much intelligence, who, perceiving that these birds had engaged my curiosity, seemed only anxious to find some new object to divert me. The sea eagle flew over us. "How fortunate!" he exclaimed: "this is what I could have wished. Look, Sir! the great eagle, and the only one I have seen since I left the lakes." I was instantly on my feet, and, having observed it attentively, concluded, as I lost it in the distance, that it was a species quite new to me. My patroon assured me that such birds were indeed rare; that they sometimes followed the hunters, to feed on the entrails of the animals they had killed, when the lakes were closed by the ice, but, when open, they would dive in the daytime after fish, and snatch them up in the manner of the fishing-hawk; that they roosted generally on the shelves of the rocks, where they built their nests, of which he had discovered several by the quantity of white exuviæ scattered below. His account will be found to accord with the observations which I had afterwards an opportunity of making myself. Being convinced that the bird was unknown to naturalists, I felt particularly anxious to learn its habits, and in what particulars it differed from the rest of its genus. Mr. Wilson had confounded it with the bald or white-headed eagle, one of the young of which he has given the figure of, to represent it. But I am strongly inclined to believe that he never saw this bird; for it must be acknowledged that he was a very close and accurate observer, and, had he met with it, could hardly have fallen into so great an error, unless he was deceived by the near resemblance which the young of these two species bear to each other in plumage, although their difference in size is very great: but, in the old birds, the likeness ceases to exist; both in habits and appearance they are totally dissimilar. I watched a pair of these birds during a season, and frequently saw them copulate, as well as the other kind, but on no occasion did they mix.

The sea eagle of America is full one fourth larger in size, than any female specimen of the other kind I ever met with, old or young. In the United States, from Massachusetts to Louisiana on the seaboard, or as high as the mouth of the Missouri to the north-west, (I speak only of the extent of country I have visited, and where I have seen them,) these birds are very rare. This will appear to all, when I say that during my many long peregrinations more than eight or nine I never found, and only one nest. The sea eagle of European naturalists, of which Mr. Bewick has given a description, and also a figure, in a small wood-cut, is more like the species in question, as to form and plumage, than any other. In mentioning this gentleman, I cannot forbear expressing the high estimation in which I hold his splendid productions; I have no hesitation in pronouncing him a most elegant and faithful copier of nature, and the very best illustrator of English ornithology. Mr. Wilson's figure is not so well done; it seems to be taken from a stuffed specimen.

My next meeting with this bird was a few years afterwards, whilst engaged in collecting crayfish, in one of those flats which border and divide Green River, in Kentucky, near its junction with the Ohio, from the range of high cliffs which, for some distance, follow the meanders of that stream. I observed on the rocks, which, at that place, are nearly perpendicular, a quantity of white ordure, thinking that owls resorted thither. I mentioned it to my companions, when one of them, who lived within a mile and a half of the place, told me that it was from the nest of the brown eagle, meaning the young of the white-headed eagle, with which he was acquainted. I assured him this could not be; and remarked that the old, as well as young, of that species never built in such places, but always in trees. Although he could not answer my objection, he stoutly maintained that a brown eagle of some kind, above the usual size, had built there; he added that he had espied the nest some days before, and had seen one of the old birds dive and catch a fish. This he thought strange, having, till then, always observed that brown and bald eagles procured this kind of food by robbing the fish-hawks: but, if I felt particularly anxious to know what nest it was, I might soon satisfy myself, as the old birds would come and feed their young with fish; he had seen them do so before. In high expectation, I seated myself about a hundred yards from the foot of the rock. Never did time pass more slowly; I could not help betraying the most impatient curiosity, for my hopes whispered it was a sea eagle's nest. Two long hours had elapsed before the old bird made his appearance, which was announced to us by the loud hissings of the two young ones, who crawled to the extremity of the hole to receive a fine fish. I had a perfect view of this noble bird as he held himself to the edging rock, his tail spread, and his wings partly so, and hanging something like the barn bank, or social swallow. I trembled lest a word should escape from my companions, the slightest murmur had been treason from them; they entered into my feelings, and, although little interested, gazed with me. In a few minutes the other parent joined her mate, which, from the difference in size (the female being much larger), we knew to be the mother bird. She, also, had brought a fish; but, more cautious than her mate, ere she alighted, she glanced her quick and piercing eye around, and instantly perceived her procreant bed had been discovered; she dropped her prey, with a loud shriek communicated the alarm to the male, and, hovering with him over our heads, kept up a growling threatening cry, to intimidate us from our suspected design. This watchful solicitude I have ever found peculiar to the female: must I be understood to speak only of birds?

The young having hid themselves, we went and picked up the fish which the mother had let fall; it was a white perch, weighing about $5\frac{1}{2}$ lbs.; the upper part of the head was broken in, and the back torn by the talons of the eagle. We had plainly seen her bearing it, in the manner of the fish-hawk.

This day's sport being at an end, as we journeyed homewards we agreed to return the next morning, being most anxious to procure both the old and young birds; but rainy and tempestuous weather setting in, our expedition was obliged to be postponed till the third day following, when, with guns and men all in readiness, we reached the rock. Some posted themselves at the foot, others upon it, but in vain. We passed the entire day, without either seeing or hearing an eagle: the sagacious birds, no doubt, having anticipated an invasion, had removed their young to fresh quarters.

I come at last to the day I had so often and so ardently desired. Two years had gone by, since the discovery of the nest, in fruitless excursions; but my wishes were no longer to remain ungratified. In returning from the little village of Henderson to the house of Doctor R*****, about a mile distant, I saw one rise from a small enclosure not a hundred yards before me, where the doctor had a few days before slaughtered some hogs, and alight upon a low tree branching over the road. I prepared my double-barrelled piece, which I constantly carry, and went slowly and cautiously towards him; quite fearless he awaited my approach, looking upon me with an undaunted eye. I fired and he fell; before I reached him he was dead. With what delight I surveyed this magnificent bird! Had the finest salmon ever pleased him as he did me?—Never. I ran and presented him to my friend, with a pride which those can only feel, who, like me, have devoted their earliest childhood to such pursuits, and have derived from them their first of pleasures; to others, I must seem "to prattle out of fashion." The doctor, who was an experienced hunter, examined the bird with much satisfaction, and frankly acknowledged he had never before seen or heard of it. The name I chose for this new species of eagle, "The Bird of Washington," may, by some, be considered as preposterous and unfit; but, being indisputably the noblest of the genus known to naturalists, I trust it will be allowed to retain it. To those, however, who may be curious to know my reasons, I can only say, that, as the new world gave me birth and liberty, the great man who insured its independence is next to my heart: he had such true nobility of mind, and honest generous feeling, as is seldom possessed; he was brave, so is the eagle; and his name, extending from pole to pole, resembles the majestic soarings of the mightiest of the feathered tribe. During the month of January following I saw a pair of sea eagles flying over the falls of the Ohio, one in chase of the other. The next day I saw them again; the female had relaxed in her severity, had laid aside her coyness, and to a favoured tree they continually resorted. I pursued them unsuccessfully for several days, when they forsook the place.

The flight of this bird is very different from that of the white-headed eagle, encircling more diameter than the latter; whilst sailing, keeping nearer to the land and the surface of the water; and when about to dive for fish, falling in a circuitous spiral manner, as if with an intention of checking all retreating movement which its prey might attempt, and only when within a few yards darting upon it. The fish-hawk often does the same. When rising with a fish they fly to a considerable distance, forming, in their line of course and that of the water a very acute angle, something not exceeding thirty degrees, when several hundred yards distant from the spot emerged from. My last opportunity of seeing the sea eagle, was on the 15th of November, 1821, a few miles above the mouth of the Ohio; two passed over our boat, moving down in easy flappings. In a letter from a kind relation, Mr. * * *, dated, "Falls of the Ohio, July, 1819," containing particulars relative to the swallow-tailed hawk (Fálco furcàtus), he also says: "Yesterday, for the first time, I had an opportunity of viewing one of those magnificent birds, which you call the sea eagle, as it passed low over me, whilst fishing; I shall be really glad when I can again have the pleasure of seeing your drawing of it." The glands containing the oil used for the purpose of lubricating the surface of the plumage were, in the specimen here represented, extremely large; the contents had the appearance of hog's fat which had been melted and become rancid. This bird makes more copious use of that substance than the white-headed eagle, or any of the Fálco genus, except the fish-hawk; the whole plumage looking, upon close examination, as if it had received a general coating of a thin clear dilution of gum arabic, and presenting less of the downy gloss exhibited on the upper part of the bald-headed eagle's plumage. The male bird weighs 14½ lbs. avoirdupois, measures 3 ft. 7 in. in length, and 10 ft. 2 in. in extent. The upper mandible $3\frac{3}{8}$ in., dark bluish black. It is, however, the same colour for half its length, turning into yellow towards the mouth, which is surrounded with a thick yellow skin. Mouth blue; tongue the same; cere greenish yellow; eye large, of a fine chestnut colour, iris black, the whole protected above by a broad, strong, bony, cartilaginous substance, giving the eye the appearance of being much sunk. Lores lightish blue, with much strong recumbent hair; upper part of the head, neck, back, scapulars, rump, tail coverts, femorals, and tail feathers, dark coppery glossy brown; throat, front of the neck, breast, and belly, rich bright cinnamon colour; the feathers of the whole of which are long, narrow, sharp-pointed, of a hairy texture, each dashed along the centre with the brown of the back; the wings, when closed, reach within an inch and a half of the end of the tail feathers, which are very broad next the body. Lesser coverts rusty iron grey, forming with that colour an elongated oval, reaching from the shoulders to the lower end of the secondaries, gradually changing to the brown of the back as it meets the scapulars. The secondaries of the last middle tint. Primaries brown, darkest in their inner veins, very broad and firm; the outer one $2\frac{1}{2}$ in. shorter than the second, the longest 24 in. to its root, and about half an inch in diameter at the barrel. The under wing coverts iron grey, very broad, and forming the same cavity that is apparent in all of this genus with the scapulars, which also are very broad. Legs and feet strong and muscular: the former $1\frac{1}{2}$ in. in diameter; the latter measuring, from the base of the hind claw to that of the middle toe, $6\frac{1}{2}$ in. Claws strong, much hooked, the hind one 2 in. long, the inner rather less, all blue black and glossy. Toes warty, with rasp-like advancing hard particles, covered with large scales appearing again on the front of the leg, all of dirty strong yellow. Leg feathers brown cinnamon, pointed backwards. Vomiting powers not exhibited, as in owls. The two stomachs large and baggy. In the specimens now described, the contents of both, fish and fishes' scales, mixed with different entrails. Guts large, but transparent and thin of substance. Heart and liver very large, the sinews of the first tough and stiff. The sex well ascertained at the time the bird was killed.

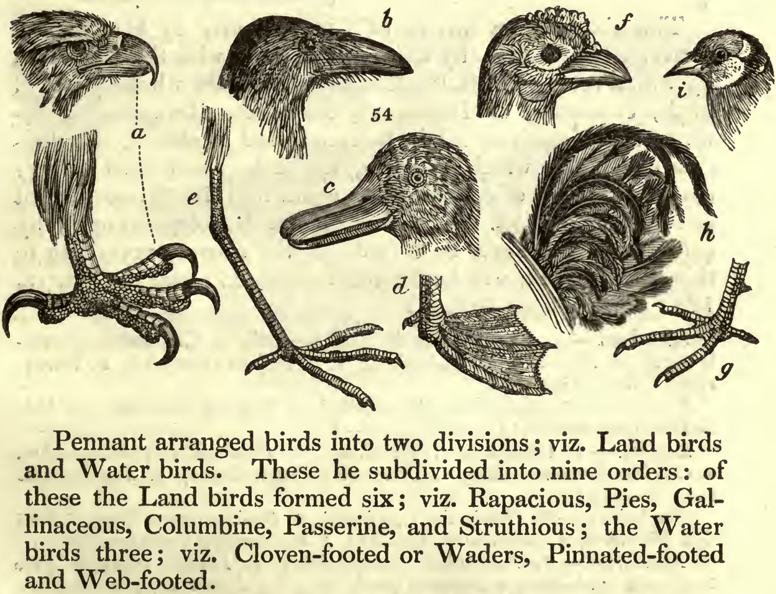
From the above account it will be seen that the bird here described and faithfully figured from a fresh-killed specimen, is a very scarce species, even in those parts where it is a native; and, that it is rarely met with, the few opportunities I have had of seeing it, the dates of which I have generally given, are a sufficient proof.

London, April, 1828. JOHN J. AUDUBON.

Art. VI. *An Introduction to the Study of British Ornithology.* By A. J. N.

Birds form the second grand division of the Linnean system of animals, and are characterised by having the body covered with feathers. The Linnean orders are six: —

1. *Accípitres* (*accipiter*, a hawk; hawk kind, or birds of prey). Bill and claws strongly arched (*fig.* 54. *a*).
2. *Pìcæ* (*pica*, a magpie; magpie kind, or peckers). Bill compressed, a little curved (*b*).
3. *A'nseres* (*anser*, a goose; of the goose kind). Bill obtuse at the end (*c*); feet webbed (*d*).
4. Grállæ (*grallæ*, stilts; stalkers). Legs very long (*e*).
5. *Gallìnæ* (*gallus*, a cock; pheasant kind). Bill convex, the upper mandible arched (*f*); toes connected by a membrane at the bottom (*g*); tail feathers more than twelve (*h*).
6. *Pásseres* (*passer*, a sparrow; sparrow kind). Bill conic, pointed; nostrils oval, broad, naked (*i*).



Pennant arranged birds into two divisions; viz. Land birds and Water birds. These he subdivided into nine orders: of these the Land birds formed six; viz. Rapacious, Pies, Gallinaceous, Columbine, Passerine, and Struthious; the Water birds three; viz. Cloven-footed or Waders, Pinnated-footed and Web-footed.

Brisson arranged birds into two grand divisions; viz. Cloven-footed and Web-footed. In the first are 17 orders and 85 genera; in the second, 9 orders and 28 genera.

Dr. Latham's arrangement is as follows: —

First Division. Land birds, Terréstres. — Order 1. *Accípitres*, or rapacious; 2. *Pìcæ*, pies; 3. *Pásseres*, passerine; 4. *Colúmbæ*, pigeons; 5. *Gallìnæ*, gallinaceous; 6. Struthiònes, struthious.

Second Division. Water birds, Aquáticæ.—Order 7. Grállæ, waders; 8. Grállæ-pinnatípedes, waders with pinnated feet; 9. Palmípedes, web-footed.

The number of genera, in the Linnean arrangement, is 78; and of species, 930. The species described by Dr. Latham amount to about 5000. The number of Dr. Latham's genera are increased, by his having divided some of the genera of Linnæus into two or more genera.

Another system has been lately brought into notice by an eminent zoologist, N. A. Vigors, Esq., (p. 80.) and which is designated the "Quinary System," because it presupposes that not only birds, but all other animals, may be divided and subdivided into groups of fives, thus:—

Birds with grasping claws, are either
- Raptòres, preyers.
- Insessòres, perchers.
- Rasòres, scratchers.
- Grallatòres, waders; or
- Natatòres, swimmers.

The six primary orders of Linnæus are, by Mr. Vigors, converted into five, by uniting the *P*ìcæ with the *P*ásseres; by which arrangement, the first division of the whole family of birds, consisting of Insessòres, Raptòres, Rasòres, Grallatòres, and Natatòres, might be considered as *classes*; the division of each of which into five, might be constituted *orders*; and the division of each of these again into five groups, might constitute the *tribes*. "So that, if the Raptòres should, by subsequent discovery, be completed, the classes, according to this arrangement, will be 5; the orders, 25; and the genera, 125." (*Jennings's Ornith.*)

Insessòres.— 1. Dentiróstres (toothed-beaked), 2. Coniróstres (conic-beaked), 3. Fissiróstres (cleft-beaked), 4. Scansòres (climbers), 5. Tenueróstres (slender-beaked).

Raptòres.— 1. Falconìdæ (falcon-like), 2. *S*trigìdæ (owl-like), 3. *V*ulturìdæ (vulture-like), 4. ——? 5. ——?

Rasòres.— 1. *C*olumbìdæ (pigeon-like), 2. *P*hasianìdæ (pheasant-like), 3. Cracìdæ (curassow-like), 4. *T*etraonìdæ (bustard-like), 5. *S*truthionìdæ (ostrich-like).

Grallatòres.— 1. *C*haràdriæ (sea-larks), 2. *G*ruìdæ (crane-like), 3. Rallìdæ (rail-like), 4. *A*rdeìdæ (heron-like), 5. *S*colopacìdæ (woodcock-like).

Natatòres.— 1. *P*elicanìdæ (pelican-like), 2. *L*arìdæ (sea-gull-like), 3. A'lcadæ (awk-like), 4. *A*natìdæ (duck-like), 5. *C*olymbìdæ (dabchick-like).

Mr. Vigors divides the order Falconìdæ thus:—

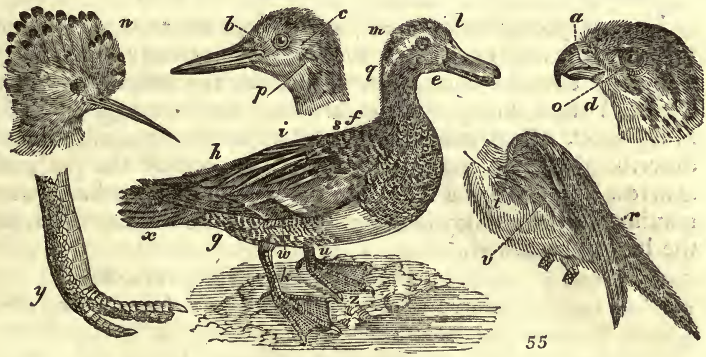
*A*quilìna (eagle-like), *A*ccipitrìna (hawk-like), Falconìna (falcon-like), *B*uteonìna (buzzard-like), *M*ilvìna (kite-like).

The Fissiróstres order is divided thus:— *M*eropìdæ (woodpecker-like), *H*irundinìdæ (swallow-like), *C*aprimulgìdæ (goatsucker-like), Todìdæ (titmouse-like), *H*alcyonìdæ (kingfisher-like).

It is a curious fact, that by far the greater number of the pie and sparrow tribes, in this country, generally lay five eggs; the quinary system is thus corroborated. The student should be aware of the censure of St. Pierre:—"Nos ornithologistes enchaînés par leur methods, ne songent qu'à grossir leur catalogue, et ne connoissent, dans les oiseaux, que les pattes et le bec. Ce n'est point dans les nids qu'ils les observent, mais à la chasse et dans leur gibecière." (*Jennings's Ornithològia.*)

It would be a great point gained, if the ingenious system of Mr. Vigors could be established on its professed basis, namely, that of nature; it would simplify the science, and render it much more easily attained by the student.

Having given this outline of the principal arrangements which have been adopted by naturalists, for the classification of birds, I have proposed to myself to begin a series of papers, in which it is intended to give particular descriptions and historical notices of our principal British birds; but, before proceeding with this, it will be necessary to give a table of the terminology used in the descriptions of birds, and to this I shall confine myself in the present communication.



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Terms used in Ornithology.

Càput, the head.
Róstrum, the bill.
Nàres, the nostrils.
Cèra, wax (on the bill) (*fig.* 55. *a*).
Língua, the tongue.
Capústrum, the face.
Lòrum, the lore (*b*).
Témpora, the temples (*c*).
Bárba, the beard (*d*).
Gùla, the chin (*e*).
Hùmeri, the shoulders (*f*).
Críssum, the vent (*g*).
Téctrices, the wing coverts (*h*).
A lula spùria, bastard wing (*v*)
Spéculum, the wing-spot (*w*).
Scapulàres, scapulars (*i*).
Caúda, the tail.
Téctrices caúdæ, the tail coverts (*x*).
Crùra, the legs (*k*).
Fémora, the thighs.
Tridáctyli, three-toed.
Didáctyli, two-toed (*y*).
Pes, the foot.
Natatòrius, palmated feet (*z*).
Frons, the forehead (*l*).
Vértex, the crown.
O'cciput, the hind-head (*m*).
Crísta, the crest (*n*).
O'culi, the eyes.
Supercília, the eyebrows.
O'rbitæ, the orbits (*o*).
Gènæ, the cheeks.
Aúres, the ears (*p*).
Cóllum, the neck.
Nùcha, the nape (*q*).
Júgulum, the throat.
Uropýgium, the rump (*r*).
Interscápulum, between shoulders (*s*).
Axíllæ, axillaries (*t*).
Hypocóndriæ, hypochondres (*u*).

Córpus, the body.
Dórsum, the back.
Péctus, the breast.
Abdòmen, the belly.
Ambulatòrii, walking.
Scansòrii, climbing.
A'læ, the wings.
Réctrices, the tail feathers.
Armíllæ, bracelets.
Dígiti, the toes.
Gressòrii, leaping.
Prehénsilis, grasping.
Lobàtus, lobed feet (*fig.* 56. *a*).
Pinnàtus, pinnated (*b*).
Calcària, the spurs (*c*).
Carúnculæ, wattles (*d*).
Inglùvies, the crop.
Semipalmàtus, semipalmated feet (*e*).
U'ngues, the claws (*f*).
Córnua, the horns.
Sáccus jugulàris, the pouch.

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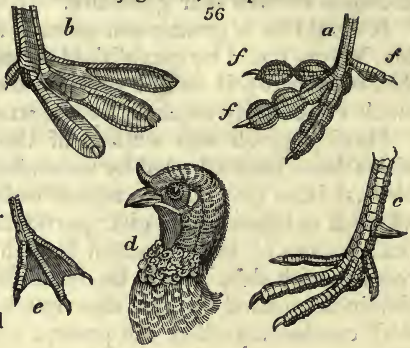

If your young readers will read these terms over two or three times, and endeavour to apply them to any bird which they may have in a cage, or stuffed in the infant museum, which, I trust, many of them are now commencing, I shall, in my next, commence with Mr. Vigor's class Insessòres, and describe the most interesting British species of the pie and sparrow kind. In the mean time, I recommend to them your maxim, that the enjoyment procured will be in proportion to the labour bestowed.

I remain, dear Sir, yours, &c.

A. J. N.

Art. VII. *Considerations on Botany, as a Study for young People, intended as an Introduction to a series of Papers illustrative of the Linnæan System of Plants.* By Miss Kent, Author of *Flòra Doméstica, Sylvan Sketches,* &c.

Sir,

In this commercial country, where there is so prevalent a tendency to judge of every thing by its returns, and where so great a stress is laid upon the question of utility, it may be necessary to accompany the recommendation of a more general study of the works of nature with a few words on this head; and to endeavour to point out some few of the many and important uses of natural history, even while I quote from your prospectus the fact, that "we are much more anxious to recommend the study on the higher principle of conducing to elegant recreation and enjoyment, than as leading merely to profitable pursuits, or utility in the lower sense of the word." In a more liberal sense, it may be observed, that any thing which affords elegant and innocent recreation, is of considerable utility.

Notwithstanding the unquestionable interest which young people generally take in the observation of natural objects, natural history has, hitherto, been singularly neglected; I mean, as a subject of *general* enquiry. Many have devoted themselves entirely to the study of nature, and such rapid strides have been made in every quarter of it, within the last century, as to keep the most zealous upon the alert, to follow in their various tracks; but, professors excepted, comparatively few persons have turned their attention to a pursuit so eminently interesting. Children are frequently observed to seize with avidity any little book that treats of the habits of animals; a thirst for further knowledge on the subject is excited, but this great advantage is lost. The early years of boyhood are generally devoted to the mysteries of grammar; and a child who is detected in reading anecdotes of the faithful attachment of dogs, of the systematic industry of the beaver, &c., is told to put away his "play-books," and learn his Latin. Thus discouraged at an early period, without the means of gaining further knowledge on the subject to which his inclination would lead him, the inclination itself gradually dies away, ending, perhaps, in a passion for birdsnesting, or the infliction of other torment upon animals; a habit more frequently to be traced to a thoughtless curiosity, and an interest in their movements, than to any actual desire of giving pain. He would see animals in action. Let him watch the labours of the bee-hive; his attention will be fixed, his interest excited, and he will have no wish to disturb the industrious colony that affords him so much amusement. Let him examine the busy activity of the ant-hill, and still he will be satisfied with the objects before him. The habits of birds being less open to observation, he seeks them in the nest; first, from curiosity; though, afterwards, it is probable that his vanity will be called into play, by the desire of multiplying the trophies of his address and agility; and he will string together the baffled hopes of many a feathered pair, proudly triumphing in their numbers, but without one thought of the bereaved mothers and their disappointed mates. If he diverts himself with catching flies, it is still in the same spirit of curiosity: they fly from place to place, he cannot trace each individual, or, in any way, understand its economy; he would know what it would do under certain circumstances; he catches one in his hand, it flutters to escape; he contrives to imprison it under a glass, and watches, with interest, its endeavours to regain liberty; he deprives it of its wings, still to see how, in such situations, the little insect will conduct itself. Let boys be encouraged in the pursuit of a species of knowledge so agreeable to them as the habits of animals; let them be supplied with books, and assisted in any little difficulties that occur to them, and a great majority will, of their own accord, devote to it even the leisure so precious to them; nor will it be too bold to say, that boys thus accustomed to think of the feelings and instincts of a variety of living creatures, will never shock humanity by the cruelty of thoughtless sports.

Girls are not only discouraged from the pursuit of natural history, but are very commonly forbidden it. Confounding innocence with ignorance, their instructors keep from them all books that may afford information which they would consider as objectionable, or excite enquiry which they would think it injudicious to satisfy. When arrived at an age to judge for themselves, young ladies are apt to be alarmed by the numerous terms of science; unacquainted with Latin, they shrink from this formidable difficulty, and either decide that, however sweet be the kernel, the shell is too hard for them to crack; or, if less diffident of their powers or sparing of their trouble, they are willing to surmount that obstacle, they are met by another, the dread of being branded with that fearful epithet — *blue!* The latter difficulty is, however, easily obviated; since the lady is not compelled to obtrude upon others the Latin terms which serve as stepping-stones to the knowledge of which she is in pursuit. I do not assert that natural history is the study the most peculiarly adapted to enable a young lady to shine in company; but neither that nor any other is surely any hindrance to it. The more we know on any one subject, the more we are prepared to throw amusement and illustration on any other.

To some branches of natural history it has been objected that their study leads to no useful result. This is applied more particularly to mineralogy, conchology, botany, &c. To speak of the latter only, which, perhaps, has been the most generally charged with inutility, I fear not to assert that the charge is unfounded. I have heard some individuals go so far as to question the utility of the knowledge of plants altogether; this extravagance can scarcely be very general; a moment's consideration of the many, the innumerable uses to which plants have been applied by mankind, and of the facility which a due knowledge of their structure and situation affords, in judging of their properties, will suffice to set aside this most unreflecting mistake. Is it nothing that a man, surrounded by plants wholly new to him, should be able, in a moment, to determine with which he might relieve his hunger with impunity? Is it nothing to know, that, however a fruit may tempt his thirsty lip, it were death to imbibe one particle of its juice? Was it nothing that Linnæus, by his knowledge of plants, at once put a stop to a mortality among the cattle in Lapland? — But enough; let us turn to the more frequent objection of the uselessness of botany, as a general study or accomplishment. We readily learn to undervalue knowledge we do not possess; forgetting that we are no better qualified to form an opinion on the subject, than to judge of a book we have not read. It is a common mistake with those who are totally unacquainted with botany, that it consists of nothing but poring over flowers with a magnifying glass, counting their stamens and pistils, &c. and then turning over half a dozen volumes of technical description; all for the purpose of ascertaining the *names* of the plants examined. Thus they take one branch for the whole body of the science, and at once decide against it as a tiresome and useless enquiry. It was once observed to me by a youth of very superior abilities and attainments, that, to him, botany appeared to be an endless solving of riddles. The simile, as far as regards one particular branch of the science, is not a bad one: but, since these riddles are only to be solved by the most attentive observation, comparison, and enquiry; since from these exercises of the mind results an acquaintance with many admirable productions of nature, which excite many of our best and most pleasurable feelings; these riddles are not to be disregarded, but rather to be encouraged, as a means of improving and refining the mind and the heart.

No one branch of knowledge can be fully appreciated by those who do not actually possess it. We can neither judge of the difficulties nor attractions of any study that we have not ourselves attempted; and it is only in proportion with our progress that we can estimate the object in view. Let us remember these truisms, and be cautious in pronouncing upon subjects of which we are wholly ignorant. Zoology is, perhaps, the branch of natural history the most generally interesting; but botany has one great advantage, in offering more opportunity for practical illustration. To females, in particular, it offers this advantage. A lady may read zoological works; may be highly interested in the endless variety of animals, and the peculiar economy of each; quadrupeds, birds, insects, &c., offer a never ending topic of enquiry and interest; but she can have little opportunity of observing for herself, of applying the knowledge she obtains, of "solving riddles." For her knowledge of living creatures, she must be indebted chiefly to books and prints; she will scarcely bring home in her delicate fingers a young hedge-hog, a hornet, or a bat, to compare with her books, and to ascertain their genus or their species; she will not dissect a monkey or a bear to study their anatomy. The habits of animals are interesting; she reads, and takes all for granted: but, in the study of plants, her interest is kept continually on the alert, by the practical application of the knowledge she acquires. We do not sit down to read Linnæus's *Génera Plantàrum*, Withering's *Botany*, or Smith's *English Flòra*, as we would Bingley's *Animal Biography*, Cuvier's *Animal Kingdom*, *Bewick*, *Buffon*, &c.: but we walk out, and day after day we see beautiful flowers springing up in the sunshine—we would know what they are; we see a lovely blossom, from which a butterfly as lovely is extracting the honey—we would be acquainted with both; but the butterfly disappears, we could not take it captive, without alarming it, injuring its beauty, and giving it pain; the flower we may appropriate, may examine at our leisure; with a few books, and a very little assistance (or, if our love of flowers be very great, with our books only), we may soon learn to discover the genus of flowers, and, ere long, to distinguish their species. In examining their construction with a microscope, how many beauties do we find that had previously been lost upon us! The beauty of flowers does not lie wholly in their vivid colours and bright contrasts: observe the starry capsule of the corn-poppy, when its fragile petals have been carried away by the winds; see the blue corn-flower (commonly called blue-bottle),—what a beautiful coronet of sky-blue florets! every floret a fairy vase, in the depth of which nature prepares sweet nectar for the butterfly and the bee! But when these have disappeared, there is beauty also in the winged children they have left, rocking each in its green cradle. In some of the species, these winged offspring are peculiarly beautiful; they seem like fairies' shuttlecocks, elegantly variegated at the base, and set with the most delicate feathers of a jet black; so delicate are these feathers, that to the unassisted eye they show like hairs. Then examine how the pistil is affixed to its centre; how one minute groove is fitted to another with a nicety of mechanism, so finished, so beautiful! What human hand could form one seed like this?—this little seed, which, in its minute and exquisite perfection, is scattered abroad by thousands, unnoticed and unseen! See the long feathery seed-vessels of the willow-herb; examine with what completeness is formed each separate floret of the many that compose the daisy. The daisy, which people call a flower, — a flower? every daisy is in itself a bouquet; a bunch of *differing* flowers, white and yellow! Lay under the microscope the flower of the forget-me-not; the silken stamens of the black mullein; the tiny blossoms of the knot-grass; the leaves of the mountain St. John's-wort, and of the perforated St. John's-wort,—its petals, too, edged on one side with purple beads. Look but at the receptacle of the common dandelion; thus magnified, it exhibits beauty well worth the seeking.

It is a notion with many, and one that I the better understand from having once partaken of it, that the study of botany detracts from our pleasure in the beauty of flowers. There is in flowers something of a poetic character, pleasurable and imaginative, which we fear to destroy by associations so mechanical as classes, orders, genera, petals, stamens, &c. The fear is groundless: we should rather look upon these systematic niceties as a foreign grammar, which opens new stores of poetry hitherto unintelligible to us. The mystery that lies in the heart and first cause of every thing, still remains the same, let us know as much as we can.

One great drawback to the study of botany has been the practice of writing botanical works altogether in the Latin tongue; but this is rather an ideal than a real obstacle; since, though such works are necessarily closed to those who do not understand that language, there are many English works on the subject; quite sufficient to enable an Englishman to become a very good botanist. For a long period, indeed, science was carefully secured from the consideration of females by its locks of Latin; and, though the absurd prejudices against female education have, in a great measure, yielded to the progress of the times, yet that language, not being generally studied by ladies, still has power to scare them from an attempt, of which it leads them to overrate the difficulties; and the sex is considerably indebted to some naturalists of the present day, who have, as far as possible, anglicised the terms of science, and simplified the subjects of which they have treated.

Let any one who is fond of flowers make the experiment; it may be made at very little expense; any of the English *Introductions to Botany*, Smith's *English Flora*, and a botanical microscope, will suffice for the commencement. I should add, perhaps, a little tin case *, in which to bring home and to preserve the plants, until they can be examined at leisure. Oh, what delight does the young botanist experience, when he first ascertains a plant by his own observation of its natural characters! With what interest is every new flower added to his store of knowledge! and when more advanced, and the common plants of the neighbourhood have become familiar, how welcome is the sight of a plant that he does *not* know! What ecstasy, if it be a rare one! What consciousness of wealth in adding to the daily increasing herbarium! I speak of the herbarium as a thing of course: for every young botanist, whose love of flowers is genuine, will be earnest to preserve specimens of the plants he examines; to serve, at once, as trophies and memorials.

I am the more zealous in my desire to extend a taste for this delightful science, from my confidence in its favourable tendencies. I look upon botany as a study calculated to improve both the mind and the body: it accustoms us to arrange our ideas; fixes our attention upon objects the most worthy of contemplation, and the best fitted to excite our admiration and gratitude; gives an inexpressible charm to our rural walks; and, while it lures us abroad, and tempts us to take a greater portion of exercise, it gives us health as well as occupation and amusement. "The study of English botany," says Dr. Aikin, "caused several summers to glide away with me, in more pure and active delight, than almost any other single object ever afforded me. It rendered every walk and ride interesting, and converted the plodding rounds of business into excursions of pleasure."†

Most persons extend their affections, more or less, beyond their own species: men love horses and dogs; some have taken delight in pet bears or tigers; ladies keep rabbits, squirrels, silkworms, birds, &c. None of these playthings affords so much amusement as flowers, with equal innocence. It may seem very startling to question the innocence of such pursuits; but what would be our opinions on the subject, could we, for a moment, fancy ourselves in the place of any one of these imprisoned favourites? Is it by choice that the giddy squirrel has forsaken the trees in which he used to frolic? Does he prefer the confinement of his cage; or, is

* Called by botanists a *vásculum*, but more readily obtained by the title of a *sandwich-box;* being precisely the same thing, and the latter name being more familiar to the tinman.

† Memoirs of Dr. Aikin, vol. i. p. 56.

he content to exchange his liberty for the pleasure of being gazed upon, when he cracks the nuts we may occasionally choose to bestow upon him? Is the lark that soars higher than the clouds, as he welcomes the morning with his sprightly song, well pleased to be imprisoned in that gloomy cage, with just space enough allowed him to hop off and on that handful of turf? Is the nightingale, who derives his birth from a land of roses, happy in being shut up in a wooden box, one half of which admits no light, during our cold and foggy winter; happy in being debarred from that annual flight to which nature urges him, in being doomed to solitary imprisonment, at a time when he should be cheering his patient mate with his song? No, no, — let us not blind our minds to the evident truth, that whatever pleasure we may derive from these little victims, is obtained at their cost; such pleasure is not innocent.

Botany has this advantage over some other branches of natural history, that it offers no temptation to cruelty. I cannot but believe that the many cruel experiments which divers naturalists have made upon various living creatures, have had a good end in view; and that those who have made them, have thought themselves authorised so to do, and believed that the end sanctioned the means. This is a great question, and one I will not attempt to discuss; I leave it to those whom it most concerns, to settle as they best can: it does not concern the general student. But there are lesser sins to which the inconsiderate might be tempted, in the zeal of enquiry; and we fear that the study of birds, insects, &c., are not a little likely to offer such temptations. In the vegetable world we have all the interest of continual change, progress, reproduction, life, and death, without the fear of inflicting pain; we may ourselves cause the existence of the most beautiful plants; we put a seed into the earth, and when we see the young leaves shoot forth, they seem almost as of our own creation; we rear them, observe their progress, and watch over their health with an interest and pleasure unembittered by such thoughts, as, to a thinking mind, take all sweetness from the melody of the captive bird. As mere amusement, the study of flowers is a perfectly innocent one: we may be satisfied with it as such; or we may derive from it a more intellectual enjoyment, by turning our attention to that higher branch of the science, which treats of the interior organisation of plants; the functions of their various parts; how acting and how acted upon; their produce and their properties, from the little chaffweed (*Centúnculus mínimus*) to the majestic banyan tree (*Ficus* índica), which is in itself a grove, a little forest; and of which Bishop Heber mentions one much celebrated, which occupies the whole of an island of the Nerbudda; and, in its best days, afforded shelter for 10,000 horse. Although said to have been planted by a saint, a great part of it, together with the ground on which it stood, has been destroyed by the sea. "But," says the bishop, "there is still enough left to make it one of the noblest groves in the world." This very singular tree might be considered as an emblem of maternal and filial love, the mother and her offspring continually affording to each other mutual support.

The study of the vegetable world has something of that soothing power which we experience from its actual presence. There is, undoubtedly, an influence in the pure air, the stillness, the calm freshness of the country, that tends to quell all unkindly feelings, and to foster the gentler affections. I can scarcely believe it possible that any bosom could harbour malice or revenge, amid flowers and trees, woods and green fields. Such scenes are favourable to reflection; and dispassionate reflection will turn anger into pity, and lend to sorrow itself a patience from which it may extract some portion of sweetness. Something of that refreshment which we experience, when, for a time, we escape the bustle and contention of a town life, and take refuge in the tranquillity of the country, we may derive from the mental contemplation of the beauties of nature. How inexpressibly refreshing to the mind is the view of the calm operations of nature, in the vegetable world, after perusing a volume of history! How delightful to turn from war, treachery, murder, violence, and evil passions of all kinds, to the calm wisdom and beneficent power displayed in the production of the humblest weed! We may fancy plants capable of a *sense* of tranquillity; they possess just that degree of animation that we may suppose to enjoy the tranquillity they inspire; somewhat like that of a slumbering child.

There are many reasons in favour of commencing the study of botany with our native plants, and those in a wild state. Plants are liable to many changes from cultivation, that would puzzle a novice; and it were well that the student should become acquainted with the freaks of nature, before he attempts to follow those of art. The genuine lover of flowers will not, however, confine himself to indigenous botany. All the plants that come in his way, or to which he can obtain access, he will desire to be acquainted with; and there are, in the environs of London, some admirable collections, that will afford him a fund of information and delight, in the study of exotics. There I leave him; bashfulness, I presume, will not impede his progress. Not so our female students; I must venture to say a word in their behalf, to the proprietors of these imported gardens. Gentlemen are, perhaps, less liable to the disappointment of which I am about to speak; I can readily suppose that there are comparatively few male visitors who are not more or less acquainted with botany, and, therefore, they would be likely to fare better than ladies, of whom the great majority go merely as to an exhibition of beautiful plants, without knowing one from another, or caring to know them, unless, it may be, the coffee tree, and one or two others of popular note. The consequence is, that those ladies who go with a view to further enquiry are liable to disappointment. A lady derives little information, and, therefore, comparatively little pleasure, from a visit to the best collection of exotics, however rare, however beautiful, however interesting, from the hasty manner in which she is conducted through them. She is not only led hastily onwards, without time to pay one hundredth part of the attention they deserve, to the plants exhibited, but is generally attended by some ignorant lad, who is incompetent to reply to any question put to him, as to the plants, their names, countries, habits, &c.; and though she may see a variety of interesting plants, all unknown to her, she will be very fortunate if she learn even the name of one or two of them. Might not this objection be obviated, by labelling the plants with their botanical names, and permitting the visitor to examine them alone, and at leisure; or attended only by a boy, whom a sixpence might compensate for his trouble, however long detained? The most interesting exotics would thus become familiar both to the mind and to the eye. It is not to be expected, but that the time of a person well qualified to give the desired information to the botanical visitor of an exotic collection, should be too precious to be lingered away in such attendance; but were the plants labelled, and the visitor allowed sufficient leisure, all persons might derive pleasure and knowledge, in proportion as they should be qualified to seek it.

I remember more than once to have experienced the evils of which I speak. On some occasions, after asking several questions of the youth who attended our party, and finding that he could not answer them; that even the answers he did give were not correct; I desisted altogether from seeking the knowledge which I went purposely to obtain, and returned but little wiser. On one occasion our party was accompanied by an able and experienced botanist; but there were older persons than ourselves, and gentlemen, in company, who, of course, engrossed the whole of his time and attention; and those who were the best qualified to understand, and the most interested in obtaining, the information he might communicate, were precisely those who learned nothing from the visit but what their own eyes could teach them. Even supposing the botanist to have been at liberty to attend to ourselves only, diffidence would have restrained us from putting to him a twentieth part of the questions we should have desired to ask; and even then, we should have preferred a more leisurely examination of the plants. It is from my own early experience, and earnest wishes, that I am led to judge of the regrets and wishes of others, and humbly to suggest the remedy.

I propose to give, in this Magazine, a series of botanical papers, illustrative of the Linnæan system; in which I shall endeavour to avoid alarming the young student with a crowd of technicalities, at the very outset, unaccompanied by any thing to bribe his attention to them. I will so disperse the husks, that they may not all lie at the top; but may, at least, allow the observer to perceive that there is grain beneath; and that for every slight layer of them removed, he may obtain a portion of it. The study of botany is much easier than appears to those who have not attempted it. Before the time of Linnæus, indeed, it was a kind of chaos; the confusion arising from the contradictions of different writers was endless. With no one acknowledged system, every botanist followed his own mode of arrangement; and it was with much difficulty that they made themselves intelligible to each other. Linnæus appeared; and not only did he arrange the whole vegetable world systematically, and according to a system, the intrinsic excellence of which, overcoming national jealousy, and the self-love of individuals, obtained its adoption over all Europe; but, by the invention of trivial names, gave a precision to his arrangement which rendered it doubly valuable. Until the middle of the last century, when trivial names were first introduced, the several species were distinguished by long Latin phrases, which, in addition to their inconvenience, were an endless source of confusion and doubt. It was as though, Christian names being unknown, we were to distinguish a family of sisters by personal description; and instead of designating one as Miss

Lucy Smith, and another as Miss Mary Smith, we should say: "Yesterday I met Miss Smith, with black eyes and chestnut hair, who is rather tall, stoops a little in the shoulders, has a pretty little foot, and speaks with a lisp; and I asked her how the Miss Smith was, with blue eyes, auburn hair, pale cheeks, and a majestic air, and with a mole on her chin." Nothing, as Rousseau observes, could be more pedantic or ridiculous, than for a person, when asked the name of a flower, to be obliged to "answer with a long file of Latin words, that have the appearance of a magical incantation;" an inconvenience, continues he, sufficient to deter many persons "from a charming study, offered with so pedantic an apparatus."

These difficulties being removed by Linnæus; and, as I have observed, some late writers having introduced a more simple language than was formerly used, the study of botany has been rendered as easy as it is pleasing; and, in gratitude to Linnæus and his successors, we should avail ourselves of the advantages they have procured us.

While writing the above, I received the fourth volume of Sir J. E. Smith's *English Flòra*, which comes, accompanied by the intelligence that its author is no more; as though he had lived but to complete that valuable work. By the conclusion, it appears, that ill health has so long delayed the publication of this volume. I have looked for it with impatience, and cannot refrain from availing myself of this opportunity of acknowledging my gratitude to one to whom botany and botanists are so deeply indebted; and whose last work has been to me, for some years past, a delightful companion, and an instructive friend.

Art. VIII. *The Jussieuean, or Natural, System of Plants.*

(*Continued from* p. 37.)

Having given a general view of the two grand physiological divisions of plants, Cellulàres and Vasculàres, we shall next present a short tabular view of their systematic subdivisions, and afterwards arrange all the genera of the plants indigenous or introduced into Britain, under the different classes, subclasses or orders, and tribes, into which they are thrown by the natural system. The following is a general view of the leading divisions, with their characters: —

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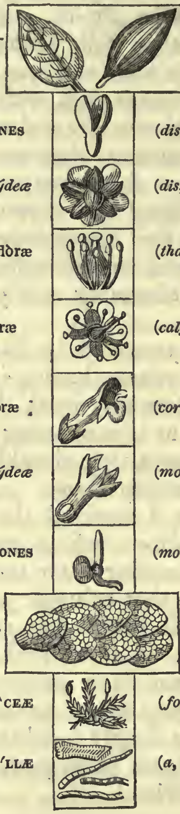

First grand Division, VASCULA`RES	(*vas*, a vessel; plants with woody fibre and cellular tissue).
First Class, DICOTYLE′DONES	(*dis*, two, and *cotyledon;* cotyledons two).
Subdivision I. *Dichlamýdeæ*	(*dis*, two, and *chlamys*, a coat or covering; calyx and corolla distinct).
Subclass 1. Thalamiflòræ	(*thalamus*, a bed or receptacle, and *flos*, a flower; stamens under the pistillum).
Subclass 2. Calyciflòræ	(*calyx* and *flos;* stamens on the calyx).
Subclass 3. Corolliflòræ	(*corolla*, and *flos;* stamens on the corolla).
Subdivision II. *Monochlamýdeæ*	(*monos*, one, and *chlamys*, a coat or covering; calyx and corolla not distinct).
Second Class, MONOCOTYLE′DONES	(*monos*, one, and *cotyledon;* cotyledon one).
Second grand Division, CELLULA`RES	(*cellula*, a little cell; plants with cellular tissue only).
First Class, FOLIA`CEÆ	(*foliaceus*, leafy; habit).
Second Class, APHY′LLÆ	(*a*, priv., and *phyllon*, a leaf; leafless).

I. VASCULA`RES.

CLASS I. DICOTYLE′DONES.

SUBDIVISION I. DICHLAMY′DEÆ.

This subdivision comprehends all the Dicotyledonous plants, that have both a calyx and corolla, by which they are distinguished from Monochlamýdeæ, in which the calyx only exists. It is in consequence of this high developement of the floral envelopes, that the greater part of flowering trees and shrubs are found in Dichlamýdeæ; it rarely happening that those with a single floral covering only have any brilliant colouring.

Subclass I. THALAMIFLO'RÆ.

Petals inserted into the receptacle.

The insertion of the petals and stamens into the receptacle is the great character of this subclass, which, therefore, contains all the polyandrous plants of Linnæus, as the Calycifl̀oræ contain the icosandrous genera of the same botanist.

Section 1. *Carpella* (*dim. of* karpos, *a fruit; aggregate pericarps*) *numerous, or stamens opposite the petals.*

Order I. *R*ANUNCULA'CEÆ.

The greater part of the plants of this order are objects of interest with gardeners, containing, as it does, many of the most elegant or showy of the tribes of hardy plants. It is here that the graceful clematis, the lowly anemone, the glittering ranunculus, and the gaudy pæony are found; differing, indeed, in external appearance, but combined by all the essential characters of the fructification. It is remarkable, however, that the acrid and venomous properties of these plants are nearly as powerful as their beauty is great. They are all caustic, and in many of them the deleterious principle is in most dangerous abundance. M. Decandolle remarks that its nature is extremely singular; it is so volatile, that, in most cases, simple drying in the air or infusion in water is sufficient to destroy it: it is neither acid nor alkaline; but its activity is increased by acids, honey, sugar, wine, or alcohol; and it is, in reality, destructible only by water. The crowfoots of our European pastures, and the *A*nemòne trilobàta and triternàta of those of South America, are well known poisons of cattle. Blistering plasters are made in Iceland of the leaves of *R*anúnculus àcris. The foliage of some species of *C*lématis is supposed to afford the means employed by beggars of producing artificial ulcers. Some of the aconites are diuretic, especially Napéllus and *C*ámmarum. *D*elphínium Consólida is said to be an ingredient in those French cosmetics which are so destructive of the surface of the skin. The *H*elléborus, famous in classical history for its drastic powers, and the Nigélla, celebrated in ancient housewifery for its aromatic seeds, which were used for pepper before that article was discovered, are both comprehended in *R*anunculàceæ. The range of this order, in a geographical point of view, is very extensive. A great number has been discovered in Europe, but they are so abundant in all parts of the world that an order can scarcely be found more universally and equally dispersed. It is singular, that, with the exception of the climbing species of *C*lématis and of Xanthorhìza, scarcely an instance occurs in *R*anunculàceæ of a shrubby stem.

Tribe 1. Clemati'deæ.

*C*lématis *L.*	*Naravèlia* Dec.

Tribe 2. *A*nemo'neæ.

*T*halíctrum *L.*	Hepática *Dil.*	Knowltòn*ia* Sal.
*A*nemòne *L.*	Hydrástis *L.*	Adòni*s* L.

Tribe 3. *R*anu'nculæ.

Myosùrus *L.*	*R*anúnculus *Bauh.*
Ceratocéphalus *Moen.*	Ficària *Dil.*

Tribe 4. *H*ellebo'reæ.

*C*áltha *L.*	*H*elléborus *L.*	Aquilègia *L.*
Tróllius L.	Cóptis *Sal.*	*D*elphínium *Tou.*
Eránthis *Sal.*	Garidéll*a* Tou.	*A*conìtum *Tou.*
*I*sopỳrum *L.*	Nigélla *Tou.*	

Tribe 5. *P*æoni'ceæ.

*A*ctæ'a *L.*	Pæòn*ia* L.
Cimicífuga *L.*	Xanthorhìza *Herit.*

Order II. DILLENI*A'CEÆ.*

Fine plants, almost exclusively confined to tropical countries. Dillèn*ia* speciòsa, a native of India, is a most noble tree with large yellow flowers, rivalling those of a Magnòl*ia.* Hibbért*ia* volùbilis is a green-house plant, well known for the beauty of its blossoms, and their powerfully fetid smell. The medical properties of this order are scarcely known; a decoction of their leaves or bark is astringent, and used for gargles; and the acid juice of the fruit of some of the species of Dillèni*a* is used in India, mixed with water, as a pleasant beverage in fevers. The foliage of many of the species is extremely scabrous, whence the dried leaves are much used for the same purposes as fish-skin and sand-paper in Europe; those of Trachytélla áspera are even employed in China for polishing works of metal.

Curatélla *L*	Trachytélla *Dec.*	Hibbért*ia* Andr.
Tetrácera *L*	Dillèni*a* L.	Colbért*ia* Sal.

Order III. MAGNOL*IA'CEÆ.*

No one is ignorant of the grandeur of Magnolias, or of the delicious, though sometimes dangerous, fragrance of their blossoms; but it is less generally known, that from their affinity to the trees that produce the famous Winter's bark, and Melambro bark, they possess medicinal qualities of no common power. The bark of all of them is said to have a bitter flavour without any astringency, and combined with a hot aromatic principle. In the United States, the bark of Magnòl*ia* glaúca and Liriodéndron *tulip*ífera is employed for the same purposes as Jesuit's bark, and from the fruit of Magnòl*ia* acumináta, a tincture is prepared which has some reputation for removing attacks of rheumatism. The fruit of Illícium *a*nisàtum is the material which flavours the liqueur called Anisette de Bourdeaux. The Magnolias are exclusively inhabitants of Asia and America, no species having hitherto been found either in Europe or in Africa.

Illícium *L.*	Liriodéndron *W.*
Magnòl*ia* L.	Michèl*ia* L.

Order IV. *ANONA*CEÆ.

The plants of this order are closely allied to Magnol*iàceæ*, from which they are principally distinguished by the absence of stípulæ, and by the structure of their anthers and seeds. The latter consist of a hard mass of albùmen, ruminated, as the botanists call it, that is to say, perforated by the substance of the seed-coat, in every direction, They are all trees or shrubs, and chiefly inhabitants of the hottest parts of the tropics, but a few have been discovered straggling into the temperate zones of America. The fruit of the *Anòna* is in many species highly esteemed as an article for the dessert, especially that of the *Cherimoýer*, which has the reputation of being the finest fruit in the world, next to the mangosteen. The hard fruits of the species of Uvària are highly aromatic; those of one of them furnish the *P*iper æthiópicum of the shops. The genus *Asímina* is the only one which contains any hardy species, and these are so delicate as to be seen very rarely in this country. In Brazil, the bark of Xylòpia serícea is used for cordage; for which it is admirably adapted.

Uvària *L.*	Artabòtrys *R. Br.*	*Asímina* Adan.
Anòna Adan.	Guattèr*ia* R & P.	Xylòpia *L.*

Order V. MENISPE'RMEÆ.

The order of Menispérmeæ consists entirely of twining shrubs with very minute flowers. They are extremely dissimilar in habit from the orders which are placed near them, and occupy their present station entirely on account of certain minute but important characters in their fructification. With the exception of Schizándra coccínea none of them are worth cultivating as plants of ornament. The berries of *Lardizabàla* biternàta are sold in the markets of Chile, under the name of *Aguilboquil*, *Guilbogui*, or *Coguill-Vqchi*, according to different travellers. The bitter diurètic, and aperient sorts of Pareira brava, are produced by a species of Menispérmum, as is also the famous Calumba root, so much esteemed for its intense bitterness, and for its use in diarrhœa and dysentery. The poisonous drug, called Cócculus índicus in the shops, is the seed of Menispérmum Cócculus. Several Brazilian species of Cócculus are said to possess powerful febrifugal properties. No species of Menispérmeæ is found in Europe; they are chiefly natives of tropical America and Asia.

Wendlánd*ia* W.	Menispérmum *L.*	*C*issámpelos *L.*
Schizándra *Mx.*	Cócculus *Dec.*	

ORDER VI. *BERBERI'*DEÆ.

With the exception of *Bérberis* this order does not contain any genus of much interest; most of the others are low, inconspicuous, herbaceous plants; *Nandìna* is an elegant Japanese shrub. The Berberises are all shrubs of much beauty and interest, especially the species with pinnated leaves, which are sometimes called Mahonias. These are all inhabitants either of Europe, Asia, or North and South America; none have ever been seen in Africa or New South Wales. Many of the finest species from Chile and India yet remain to be introduced. The berries of the Berberises are acid and astringent; the latter quality is especially abundant in the stem and bark.

*E*pimèdium *W.*	Caulophýllum *Mx.*	*Bérberis* L.
*L*eóntice *L.*	Diphyllèia *Mx.*	*Nandìna* Thun.

ORDER VII. PODOPHYLLA'CEÆ.

Little interesting herbaceous North American plants, nearly related on the one hand to *N*ymphæàceæ, and, on the other, to the herbaceous genera of *Berbéri*des. Their juice is held to be purgative.

Podophýllum *L.*	Jeffersòn*ia* Ph.

ORDER VIII. HYDROPELTI'DEÆ.

This order differs from *N*ymphæàceæ chiefly in having a definite number of seeds. It consists of only two genera, each containing a single species. Both are little floating plants of tropical and northern America. Nothing is known of their properties.

Hydropéltis *L.*

ORDER IX. *N*YMPHÆA'CEÆ.

Like the last, these are all floating plants, and, to gardeners, possessed of great interest, on account of the elegant form and various hues of their flowers. Two species are known as the lilies of our own streams and ponds, and the remainder occupy similar stations in other countries. Some of the Indian species of *N*ymphæ`a are delightfully fragrant. The holy cyamus, or Pythagorean bean of antiquity, is the produce of the *Nelúmbium*, a stately aquatic, which abounds in all the hotter countries of the East, where its roots are frequently used as an article of food. The ditches about Pekin and other Chinese cities, are literally choked up with its abundance. The pericarpia, or beans, are oblong, hard, smooth bodies, and possess the power of vegetating after having been dried for even thirty years. The flowers and roots of the common white *N*ymphæ̀a have been long celebrated for their sedative and antiaphrodisiacal qualities, which are, however, now considered doubtful. In Sweden, in years of scarcity, the roots of *N*ùphar lùtea are pounded into cakes, along with the inner bark of *P*ìnus sylvéstris.

This order has been the cause of much difference among botanists, as to its true station in a natural classification, its structure being of so doubtful a character as to leave room for disputing whether it belongs to Dicotylédones or Monocotylédones. Upon this subject M. Decandolle has the following remarks: "Gærtner declares that the embryo is undivided, and therefore monocotyledonous. In 1802, I remarked in the *Bulletin Philomathique*, that the embryos both of *N*ymphæ̀a and *N*ùphar are enclosed in a peculiar integument, and that a dicotyledonous structure is apparent when that integument is removed; shortly after, M. Mirbel declared that the embryo of *Nelúmbium* has two thick cotyledons; in 1806, M. Turpin gave an accurate description of the fruit of *Nelúmbium* lùteum, without however removing the doubts about the real structure of the embryo; and two years afterwards his colleague, M. Poiteau, described the seed and germination of the same plant, pointing out that the embryo consisted of two thick cotyledons enclosed within a stipular membrane, but destitute of radicula: this was subsequently confirmed by M. Mirbel after very minute anatomical examination; that observer compared the seed of *Nelúmbium* to the seed of *A*mýgdalus, and also to that of *P*ìper and Saurùrus, and also demonstrated that the structure of the stem was analogous to that of exogenous or dicotyledonous plants. A very different opinion was shortly afterwards held by M. Correa de Serra, an observer of the highest order, who admitted indeed that *N*ymphæàceæ are exogenous, but contended that the parts which had been taken by previous observers for cotyledons were, in fact, a mere expansion of the radicle, and that cotyledons were as entirely absent in *Nelúmbium* as in *Cúscuta*. In the meanwhile M. de Jussieu adhered to the old opinion, that *N*ymphæàceæ are monocotyledonous; in which he was supported by the late Professor Louis Claude Richard, a name for ever memorable in the annals of Carpology (*karpos*, a fruit, *logos*, a discourse), who published a new view of their structure, in which he differed materially from all his predecessors; this botanist considered the stipulary membrane of Poiteau a simple cotyledon, and the cotyledons of that writer the hypoblastus (*hypo*, under, *blastos*, bud), or *body of the radicula;* he also refused to admit any evidence derived from the anatomical structure of the stem. In this conflict of opinions, we have determined to station *N*ymphæàceæ among Exógenes, for the following reasons: 1st, because the structure of their stem is that of Exógenes rather than of Endógenes; 2dly, because the two opposite bodies, enclosed within the little bag or stipulary membrane described by Poiteau, appear to be undoubtedly cotyledons, which is confirmed by the presence of a plùmula between them in *Nelúmbium;* 3dly, because of the structure of their flower, which has a great affinity with that of *P*æòn*ia*, Magnòl*ia*, and *P*apàver; 4thly, on account of the similarity between their fruit and stigma and that of *P*apàver; 5thly, because of their milky juice and convolute leaves, two characters which are not known to exist among Endógenes." Those who are interested in pursuing this curious discussion any farther, will find many remarks and illustrative figures in the English edition of the *Analyse du Fruit*, published by Mr. Lindley in 1819.

*N*ymphæ'a *Neck.*	Earýal*e* Sal.
*N*ùphar *Sm.*	*Nelúmbium* J.

Section 2. *Carpella solitary or connate; Placéntæ parietal.*

Order X. *P*APAVERA'CEÆ.

These plants are better known for their medicinal properties than for their beauty. Some of them are the common pests of corn-fields, and with grain have been disseminated over all the world. Sanguinària is a neat little American plant, well known for its crimson juice, and the emetic purgative powers of its roots. Saracèn*ia* is a genus of very doubtful affinity; consisting of curious little American marsh plants of difficult culture, and remarkable for the singular pitcher-like form of its leaves. The peculiar power of the poppy is, as is well known, narcotic; a property which pervades all the order, although in a less intense degree in all but the officinal *P*apàver somníferum, from which exclusively the drug opium is obtained. The Mexicans use the expressed oil of the seeds of Argemòne mexicàna for polishing furniture, and in Holland an oil used as a substitute for that of olives, is expressed from the seeds of *P.* Rhœ'as.

*P*apàver *Tou.*	Glaúcum *Tou.*	Boccòn*ia* L.
Sanguinària *L.*	Meconópsis *Vig.*	Saracèn*ia* L.
Chelidònium *Bank.*	Argemòne *Tou.*	
Römèr*ia* Med.	*H*ypécoum *L.*	

ORDER XI. FUMARIA'CEÆ.

Tender herbs, with finely cut leaves and annual stems, abounding in a watery juice; without any appearance of milkiness. They are reckoned slightly diaphoretic and aperient, but their medical properties are trifling. Formerly they were combined with Papaveràceæ, from which they are now universally distinguished. The greater part of them are natives of hedges or thickets in the cooler parts of the northern hemisphere; two are natives of the Cape of Good Hope. Many of the species are beautiful ornaments of the flower-garden.

Corýdalis *Dec.*	Diclýtra *Borc.*	Sarcocápnos *Dec.*
Cysticápnos *Boer.*	Adlùmia *Rafi.*	Fumària *Tou.*

ORDER XII. CRUCI'FERÆ.

The importance of this order to mankind, and the singular nature of its botanical characters, render it expedient to speak very fully upon it; in which the remarks of the learned M. Decandolle, who has paid Crucíferæ particular attention, will be chiefly followed. The order consists wholly of annual or perennial, often biennial, herbs, occasionally assuming a suffrutescent habit; then, however, never exceeding the height of three feet. The roots are either thick and perennial, or annual or biennial and slender, almost always perpendicular and undivided. The young roots are tipped with a little sheath, called the coleorhìza (*koleos*, a sheath, *rhiza*, a root), which is produced by the extended ruptured coat of the epidermis, when the rootlet first appears. This is a curious character, and deserves attention. The stems are round or somewhat angular, branched, and often, even in the annual species, indurated at the base. The branches proceed from the axillæ of the leaves, but the uppermost ones are abortive in most cases. The racemes are always opposite to the leaves; sometimes the terminal branch is abortive when the raceme appears to be terminal; but this is merely owing to that circumstance. The leaves are simple, generally radical or alternate, rarely opposite. The flowers are either white, yellow, or purple, or, in a few Cape species, bright blue. The fruit is called either a síliqua or silícula; the former being a linear pod containing many seeds, the latter a roundish pod containing one or very few seeds, whence this order, which is the same as the Linnean class Tetradynàmia, is divided by Linnæus into two parts, called Siliquòsæ and Siliculòsæ. In the seed, the radicle and cotyledons are applied to each other in different ways, from which the suborders of M. Decandolle derive their characters. When the edge of the cotyledons is pressed close to the radícula, so that a cross section would be thus o =, the cotyledons are said to be accumbent, as in all Pleurorhízeæ (*pleuron*, the side, *rhiza*, a root); when the side of the cotyledons is pressed to the radícula, thus o ||, the former are called incumbent, as in Notorhízeæ (*nōtos*, the back, *rhiza*, a root). If the cotyledons are incumbent, and at the same time half folded together or conduplicate, thus o > >, the suborder Orthoplòceæ (*orthos*, upright, *plokē*, a fold) is formed; when the cotyledons are incumbent and spirally twisted, so that a section would resemble this o || ||, they constitute the suborder Spirolòbeæ (*speira*, a spire, *lobos*, a pod); and finally, when the cotyledons are incumbent, and doubled twice in their length, thus o || || ||, we have Diplólobæ (*diploos*, double, *lobos*, a pod).

(*To be continued.*)

Art. IX. *A short Notice of the Occurrence of Footsteps in the Sandstone of Corn Cockle Muir, in Dumfriesshire.* By K. N.

In a quarry, situated in the New Red Sandstone district of Dumfriesshire, about three miles north of Lochmaben, the workmen, in the course of excavating stones, have for some time discovered marks which correspond exactly in appearance with the footsteps of some four-footed animal. The rock has been long quarried for building materials, as well as for paving stones, (for each it is well adapted, owing to its laminated structure,) and the existence of the foot-marks has been known for fifteen or sixteen years, though little notice was taken of them, until they attracted the attention of Dr. Duncan, minister of Ruthwell, who has been most assiduous in investigating the fact, and in making it public. The strata dip to the south-east, under an angle of about 37 or 38 degrees.

It is particularly worthy of notice, that the marks are not confined to one part of the bed; on the contrary, they are found on almost each succeeding layer, and are met with at the spot where the quarry-men are now working, which is more than 40 ft. below ground The laminated structure of the bed, which is easily divisible into layers of various thicknesses, from the breadth of an inch to that of several feet, demonstrates that the sandstone was not all deposited at one time; as, in that case, it would most probably have formed one solid compact mass. It is on the upper surface of these layers that the footsteps exist; and each succeeding lamina, on its deposition, appears to have filled up the indentation beneath, like plaster of Paris poured into a mould. On separating two layers, were it not for the friable nature of the sandstone, which causes it to break and remain in the matrix, as it were, the lower surface of an upper layer would exhibit an exact cast of the indentation beneath. As it is, the substance of the sandstone thus remaining in adheres so slightly to the cavity, that it is generally easy to scrape it out, without at all injuring the shape of the foot-mark. This fact will decidedly prove that the marks do not proceed from any fossil contained *in* the sandstone (an idea which might probably occur to a person who had not seen any specimens); as, in that case, an INDENTATION would be left both in the upper and under laminas, which is not the case.

The strongest proof that the marks were caused by animals is their arrangement in two parallel lines, and at regular distances from each other, and the agreement in shape and position of the alternate marks, by which the hind foot is easily distinguishable from the fore. One specimen, a slab about 8 ft. long, which was taken out of the quarry some years ago, contains no less than twenty-four footsteps, in which the most perfect order is preserved; so that, were it not for the hardness of the stone, it would not be difficult to believe that an animal had just passed over it.

In this specimen the mark of the hind foot comes up to, and in some places partly effaces that of the fore. In the quarry the footsteps are found ranging in distinct and regular tracks. Their direction is up and down the strata; in no instance do they extend across. They are not all of the same size or shape. In one set the *toes* in the front of the foot have left a very distinct impression, while the *heel* has displaced and turned up the sand *behind* at each successive step. In another variety the toes are scarcely discernible, and the heel seems to have slid some way from the spot where it was first put down, gradually sinking until the animal acquired a firm footing. The difference of these two sets of marks has been accounted for by supposing them to have been caused, the former in the ascent, the latter in the descent, of the animal. If that were the case, we must suppose that the sandstone existed in its present inclined position while yet in a soft state; a fact quite at variance with the theories at present current among geologists.

The cause of this difference may perhaps be explained by supposing that they are the foot-marks of distinct species of animals. As they are never found intermixed, but always in separate tracks, and as, in the latter of the two varieties enumerated, the length of the steps is greater than in the former, in proportion to the size of the foot, this supposition is not without foundation.

Professor Buckland has given the credit of the foot-marks to an animal of the genus *Testudo*. A comparison has been ingeniously instituted by that gentleman between the foot-steps in the stone and those made by recent tortoises. For this purpose he has caused live animals of that genus to walk over soft clay or dough, and the result tends decidedly to confirm his opinion; and here it may not be out of place to notice some observations made by a writer in a late number of the *London Magazine* * upon this subject. It is there remarked, "They (the Geological Society) had much better have refrained; for when the tortoise was at length prevailed on to walk, he insisted on walking as straight as an arrow; whereas the antediluvian tortoise's march was as crooked as a ram's horn." Now, it happens unfortunately for this statement, that the marks in the sandstone rock run in a direct line. It is true, the tortoise showed at first some unwillingness to stir, but, when he did move, he proceeded forward in quite as straight a course as his "antediluvian" progenitor.

No remains of the tortoise have hitherto been found in strata older than the lias; but we must not, on that account, refuse to believe that they existed at a still earlier period. The discoveries that are made every day in geology, though they tend to confirm and establish that science, should yet teach us how much remains to be learned respecting it.

K. N.

Art. X. *On the Crystallisation of Gold.* By the Rev. John Stevens Henslow, Professor of Botany in the University of Cambridge.

Dear Sir,

The crystallisation of gold from a state of fusion is on record; but I am not aware that any one has observed a similar effect to have resulted from its solution in acid. Perhaps, therefore, you may consider the following notice worth inserting in the Naturalist's Magazine.

Yours, &c.

Cambridge, March, 1828. J. S. Henslow.

A small glass-stoppered vial, containing a solution of gold in a mixture of nitric and muriatic acids, had stood neglected

* London Magazine for March, 1828, p. 356.

for a considerable time (perhaps four or five years) in a cupboard. Upon accidentally examining it, I found a portion of the acid had escaped, and the gold crystallised. This effect had probably been promoted by a flaw in the vial, which extended through the neck, and a little way down its length. The stopper, in consequence, must have been slightly loosened, and thus allowed more space for the formation of a thin dendritic crystallisation of the gold. This was further continued down the inner surface of the vial, and was there sufficiently thick to admit the impression of minute but distinct crystalline facets. A small crystallised lump of gold lay at the bottom of the vial; but I believe this had been originally attached to the rest, and merely fallen by its weight, as I have since observed to be the case in another portion. Around the stopper, and along the flaw, there was a saline concretion, which tasted like sal-ammoniac, and as ammonia was kept in the same cupboard, it had probably united with the muriatic acid as it exuded. Upon finding this specimen, I examined some other metallic solutions, and found a similar separation of the metal had taken place in a vial containing a solution of platina, and in another containing a solution of palladium. In both these cases, a thin, interrupted, and dendritic lamina of metal might be seen between the stopper and the neck; but the crystallisation had proceeded no further. I unstoppered the vial containing the platina, and the lamina (as might have been expected) immediately disappeared in the form of a slight muddy film. The palladium I still possess. Probably this phenomenon may be of frequent occurrence; but as the separation of the metal does not often extend below the neck of the vial, it may have passed unnoticed. These facts, if multiplied, may, perhaps, serve to throw some light upon the mode in which the dendritic laminæ of native gold, silver, &c. are formed in rocks.

Art. XI. *Introductory Sketch of the Objects and Uses of Meteorological Science.* By E. W. Brayley, Jun. A.L.S.

The narrow limits within which our knowledge of the physical constitution of the planet we inhabit is confined, have been frequent subjects of remark with general writers on Natural History. Little more of "the great globe" is cognizable to us than the configuration of its surface, with the vegetable productions which invest that surface, and the animals by which it is peopled; the affections, arrangement, and structure of the fluid and solid matter, to an insignificant extent, beneath; and the nature and phenomena, to a height not exceeding that of the greater inequalities of the surface (themselves so proverbially inconsiderable in comparison with the earth itself) of the ever-moving mass of elastic fluid, or the atmosphere, which rests upon it. But unimportant as these may appear, when compared with the vast bulk of the earth itself, or with the still more stupendous magnitude of the system of worlds of which it forms a part, they comprehend that region of our own world, in which Man — the being for whom all has been created — is destined to exist; and they furnish, whether viewed merely in themselves, or in their relations to him, innumerable objects of delightful contemplation.

Now, on taking a general view of this our domain in the system, and of the indefinite multitude of objects it presents, we shall find them to consist of two classes; which, though intimately connected together, as they exist in nature, are, in themselves, perfectly and essentially distinct, — possessing, in fact, opposite attributes. These two classes have been termed, by common consent among naturalists, *inorganic* bodies, and *organic* bodies or beings. The former, as their very name indicates, and as is the case with the less perfect subjects of science in general, are distinguished from the latter chiefly by negative qualities. They include the various subjects of the *mineral* kingdom, discriminated in an obvious and especial manner from those of the animal and vegetable kingdoms, which constitute the class of *organic* or *organised* existences, by not possessing the power of reproducing individuals similar to themselves, and by undergoing increase of size merely in consequence of the addition of fresh matter *from without*, not, like plants and animals, by the secretion or production of fresh matter *from within*. These *inorganic* bodies, it is evident, have been created, and exist, for the sake of the *organic* departments of nature, as they, in their turn, exist for the sake of Man. The surface of the earth, on which organic beings exist, consists of an aggregation of inorganic substances; and the same substances, arranged in the most exquisite and harmonious co-ordination, according to the peculiar quality of the life of each being respectively, form the *basis* of that *organisation*, or disposition of parts for the reception and manifestation of life, which is the grand characteristic of the higher kingdoms of nature. These truths are so obvious, that they scarcely require illustration; but as every article in the Magazine of Natural History is intended for the perusal of the general reader, as well as for that of the man of science, it may be as well to exemplify them by reference to some particular instances.

The soil, then, in which plants grow, and on which animals live and move, is derived, in the first instance, from the pulverisation of some stratum, or some rock, forming the original surface of the earth ; this may be either granite, sandstone, clay, limestone, or chalk, &c. Now these rocks and strata consist of various inorganic bodies or *minerals*, aggregated together in various ways ; and the solid parts, forming the basis of the more delicate organisation of plants and animals, consist also of similar substances, to which the arrangement effected by the vital powers has given an *organic* form, — or disposed into structures and tissues of *vessels*, — for the purpose of receiving, adapting, and making use of the different fluids destined to be the agents employed by the vital powers in sustaining the manifestation of life. Thus the reticulated epidermis, or outer coat of the plants which have hollow stalks, including the reeds, the grasses, and the various species of cane, consists principally of the originally *inorganic* substance *silica*, of which, in various states of combination, a great part of the earth's surface is formed. Thus, also, the *skeletons* of the vertebrated animals are composed of the inorganic substance lime, combined with *phosphoric acid ;* and the *shells*, which serve as external skeletons to the molluscous animals, including the different kinds of shell-fish, consist chiefly of the same earth combined with *carbonic acid*, or in the state of *carbonate of lime*, which *inorganic* substance forms many great ranges of mountains, and many extensive plains.

Having taken this glance at the two primary divisions of natural things, — the *inorganic* and the *organic* subjects of creation, — we will now proceed to examine the phenomena attending the distribution of the latter over the surface of the earth ; phenomena which are connected immediately and in a very important manner with the main subject of the present article, namely, the objects and uses of meteorological science. But it appeared expedient, on entering so wide a field of enquiry, to take, at first, a comprehensive view of the relations to each other of several departments of the creation, in order to counteract the fallacious ideas of disunion and independence among natural objects, which the segregation and separation of them in the mind, for the purpose of scientific investigation, has a tendency, from the imperfection of the human faculties, to produce.

The life and well-being of organised nature in general, and of plants and animals in particular, are sustained primarily by an unseen and mysterious energy operating within them; but organised beings depend, for the outward support of their existence, or rather for the preservation of the substances on which their organisation is founded, in a fit condition for the use of the inward powers of life, on the heat and light of the sun. And in a mediate manner, therefore, they depend on the atmosphere, which is the medium by which the rays of that glorious luminary are accommodated to their reception. Hence they are distributed over the surface of the globe, with relation to the peculiar qualities of every class, according to certain laws by which we are accustomed to express the phænomena of *climate*, and which are regulated, chiefly, by the relations to heat or *temperature* of the parts of the earth respectively inhabited by each group of animals or plants. These relations to temperature are of two kinds. The first depends on the position of the locality, or place where the beings naturally exist, with respect to the equator, or rather to the ecliptic, or, more strictly still, with respect to the plane in which the earth revolves around the sun; for on this relation depends the temperature of the place, so far as it is produced, directly, by the influence of the sun. The second of these relations to heat depends on the elevation of the locality above the mean level of the earth's surface, — usually estimated, for the purposes of science, from the level of the ocean, — for on this depends another cause of difference of temperature, in consequence of the *decrease* of density, as we ascend in the atmosphere, and the corresponding reduction of temperature by the *increased* capacity for heat of rare air; the highest situations being the coldest in each latitude respectively.

According, then, to the laws of temperature, arising from the combined influence of *latitude* and *altitude*, as just explained, are the innumerable subjects of organised nature distributed throughout the globe, whether the land, the waters, or the atmosphere be the principal scene of their existence. Next to the solar beams, as an agent in the support of life, in all its various forms, is *moisture*, which appears indeed to operate as a medium, in conveying and imparting to the solid substances of organisation the influence of the imponderable agents, as heat, light, and electricity, as well as that of the vital energy itself. And the state of moisture depending primarily on the presence of aqueous vapour, its quantity and its tension or elasticity is of course finally dependent on temperature and on the agency of solar radiation. Certain plants and animals are peculiar, as is well known, to the tropical regions, where an unvarying high degree of heat prevails, with its necessary concomitant, a very humid atmosphere, whence the richness and luxuriance of organic existence in these climes, in all its departments. Others thrive only in the temperate latitudes; and others, again, like the Polar Bear and the Walrus, and, in the vegetable world, many Lichens, which are accommodated to sustain the cold of a region, the mean annual temperature of which is below the freezing-point, people the frigid zones, or clothe their rocks and plains with a peculiar though scanty herbage. From the combination of the two causes of temperature above described, an effect of great interest to the Meteorologist and the Naturalist results in the equatorial climates. In these the solar temperature is higher than in any other part of the globe; and in these, also, the mountains and the elevations forming what is called table-land, are higher than elsewhere, ascending, of course, into comparatively colder regions of the atmosphere. It hence follows, that if we ascend, in the torrid zone, from the level of the sea to the summits of the mountains, we pass through all the various climates, with their respective gradations of organised matter, which each hemisphere of the entire globe presents, as we proceed from the equator to the pole. This is abundantly exemplified in the Floras of New Spain and Nepal, which have of late so immensely enriched the stores of the Botanist; and the distribution of insects furnishes us with further illustrations of the phenomenon.

In considering these laws, we may observe a very striking distinction between organic and inorganic matter. Inorganic bodies, which have no direct dependence, in the present state of the earth at least, on the solar heat or its consequences, are distributed throughout the globe, without any relation either to latitude or to altitude, as involving peculiarity of temperature. Thus, native gold and the ores of iron are found, indiscriminately, in every latitude, from the equator to the poles, and at every elevation above the level of the sea. Thus, also, the earthy substances, silica and carbonate of lime, with granite and limestone, rocks essentially composed of them, occur under the equator in Sumatra and South America, in the temperate zones in the Alps and the British Isles, and within the arctic circle at Baffin's Bay; whilst they are found at great depths below the mean level of the surface, as in mines, on the surface itself, and at every altitude above it, from the gentlest undulations of the land to the summits of the loftiest mountains.

On attentively surveying the objects and phenomena of inorganic nature in general, we find that two, or more correctly, perhaps, three great divisions are presented to our view. This department of creation embraces what is termed the *mineral* kingdom, which includes the various rocks and strata, and individual mineral substances composing the surface of the earth; and also what we may perhaps not improperly call the *Atmospheric* kingdom of nature. For it seems obviously improper to refer the various aëriform fluids constituent of the atmosphere to the *mineral* kingdom, with which, however, they must be associated, unless we thus constitute for them a distinct province. And as the atmosphere extends its influence in an equal degree over the three kingdoms, the animal, the vegetable, and the mineral, though received by, and operating upon each, after a distinct manner, it would appear rather to be independent, and allied to all of them, than to be rightly included within any one.

But these two divisions of inorganic nature, — the mineral and atmospheric kingdoms, — become amenable to each other's influence, principally by means of an intermediate agent; — by means of the ocean and the other repositories and sources of water, in its ordinary inelastic state of fluidity, with which the earth is replenished. This *Aqueous* kingdom of nature is the grand source whence the atmosphere derives its watery contents, which are poured down again to refresh and supply the objects on the solid surface,—partly enter into their composition in various ways, and in part return to the ocean, to be again raised into the atmosphere by the agency of the sun, and undergo that perpetual circulation, which is as essential to the aggregate well-being of the objects on the globe's surface, as is the circulation of the blood to the life of the animal frame. By the ocean, the rivers, and the lakes, also, as repositories of temperature, the combined influence of the sun and the atmosphere on the organic substances which the "mineral kingdom" supports, is suitably modified for their reception and requirements.

Now it is the object of Meteorology to investigate and discover the modes of operation, and the causes, instrumental as well as final, of the multitude of interesting phenomena, the influence of which on the vegetable and animal kingdoms we have briefly traced in the foregoing remarks. To this science belongs the examination of the force of radiation from the sun, or the temperature directly produced by his beams — the inquiry into the constitution, mechanical as well as chemical, of that intimate mixture of gaseous bodies, which is the subject of what are called *atmospheric* changes — the scrutiny of the laws governing the variations of *climate* — that also of those which regulate the diminution of heat in the atmosphere, in proportion to the altitude — the developement of the principles determining the quantity and state of the aqueous portion of the atmosphere, — and the acquirement of knowledge, in short, on every subject of science presented by the atmosphere itself, or by its modes of relation to the aqueous and mineral kingdoms, and the general laws of its influence on organised matter.

This branch of Natural History also comprehends the examination of two great series of phenomena, not strictly comprised by the foregoing enumeration; by which, on the one side, its boundaries are united with those of Physical Geography, and, on the other side, with those of Astronomy. The temperature of the interior of the earth itself, and that of the ocean, as well at the surface as at every accessible depth — subjects of the greatest interest, with respect not only to the present state of the earth, but also to its former physical condition — are so intimately connected with the temperature and other affections of the atmosphere, that the study of them becomes, in fact, a department of Meteorology. And the various kinds of luminous and igneous meteors which *appear* within the atmosphere, though some of them *originate*, in all probability, in distant regions of the solar system, — such as the zodiacal light, the polar lights, or *Auròra Boreàlis* and *Austràlis*; the meteors called shooting-stars, and the stupendous masses of matter in combustion called *fire-balls*, which cast down upon the earth immense blocks of red-hot iron, or showers of heated stones, — constitute another wide field of meteorological enquiry.

It has been deemed proper, in commencing the meteorological department of the *Magazine of Natural History*, to set out with a general outline of the bearings of Meteorology on the investigation of some other principal objects of the naturalist's attention. On resuming this article in a future number, we shall proceed to a more specific and detailed view of the subjects of meteorological research.

April 10. 1828.

(*To be continued.*)

PART II.

REVIEWS.

Art. I. *Experimental Researches in Natural History.* By John Murray, F.S.A. F.L.S. &c. London. 12mo, pp. 177. 6*s.* Reviewed by M.

The author of this little work has chosen some of the most remarkable phenomena in nature for description and illustration. His first two subjects are on the light of the glow-worm and the luminosity of the sea. Both are treated with much practical knowledge, gained, it would appear, from extensive and patient investigation. He first speaks of the nature of light, and declares himself a follower of Newton, in the opinion that it is "material, and consisting of particles, exceedingly minute, cast off from the luminous surface," and rejects the idea of Descartes and others, that light is only a "mere quality."

The author next adverts to the origin of light, but which is the least luminous part of his essay. Descending to his mundane object, he considers, in his way, reflected, phosphoric, electric, and spontaneous light emitted by various minerals, animals, vegetables, and their combinations.

The luminosity of the sea, afterwards fully treated of, he says is caused by the presence of luminous insects, as the Cáncer fúlgens, shining crab, &c.; and many instances of spontaneous light are evolved by chemical processes and combinations, under the action of heat, as the Chlorophane (*chlōros*, green, *phainō*, to shine; gives out a beautiful apple-green light when placed on a heated iron; petalite (*petalon*, a thin plate; laminar fracture) rubelite (*rubellus*, reddish; colour), tungstate of lime, anatase, &c.

Many substances, according to Mr. Skrimshire, emit light on being brought within the circuit of an electric current, as alum, sugar, chalk, &c.

Some diamonds emit light in the dark, and especially, according to Boyle, if slightly heated, rubbed, or compressed. "Canton's phosphorus," not described by the author, "and the Bolognian stone, are phosphorescent when heated." Of this last curious substance, it has been said by naturalists, that it retains the light of the sun for several hours after being exposed to it; but Mr. Murray takes no notice of this property, only that it becomes luminous, like many other substances, on being heated, independent of light. He also points out the potato, decayed wood, several fish, as mackerel, whiting, &c., as emitting light; and of plants, the Tremélla meteórica, the Indian cress, and the subterranean Rhizamórpha (*rhiza*, root, *morphē*, form; resemblance) also evolve light in certain temperatures.

Percussion and friction are common sources of light, and many instances of luminous exhibitions occur in chemical practice, as well as in nature, which lead to the conclusion, that "the light in luminous animals is a consequence of, and has its being in, a peculiar organisation."

The luminous spherulæ of the glow-worm is a transparent sac or capsule, through which, as through a window, the light shines: it is quite distinct from chemical combustion and solar light. Of the latter the author gives a concise description, which may be best detailed in his own words.

" When a beam of solar light is intercepted by a prism, it unfolds a very beautiful and interesting spectacle. Seven colours are presented; and the 'bow of promise in the storm' affords a magnificent illustration of its phenomena. The colours thus unveiled are violet, indigo, blue, green, yellow, orange, and red; and they are refrangible in this order, the violet being the most easily refracted or bent, and the red with difficulty refracted. Agreeably to the doctrine of chromatics, taught us by Sir Isaac Newton, when all the colours are absorbed the object is black. Black, therefore, is the absence of all colour. On the other hand, when all the colours are returned or reflected, the object is white; when a particular colour is reflected, while the others are absorbed, the body appears of that particular tint." It is added, " that colour is the gift of light, numerous phenomena concur to assure us;" but he also avers that " there remain many circumstances extremely difficult to be accounted for; so that colours are to be considered accidental rather than essential properties of bodies." This part of his observations on light would, perhaps, have been clearer had he said that colours are the gift of form and position.

After some further disquisition on light and colours, in which a considerable share of sound philosophical knowledge is elicited, he comes to the examination of the light of the glow-worm.

Of luminous insects in this country, the *Lampy̆ris* (*lampō*, to shine, *pyr*, fire) noctilūca (*noctiluca*, a candle) (*fig.* 58.), or glow-worm, and the *S*colopéndra eléctrica, are the most conspicuous and common. The *S*colopéndra is found in Huntingdonshire, and the *L*ampýris spléndida in the vicinity of Oswestry. The male glow-worm yields light as well as the female, but much fainter. The eggs are also, in some degree, luminous. Their light, which they have power to extinguish at pleasure, proceeds from brilliant spots on the three last rings of the body, under the tail; the luminous matter is a yellow substance, contained in vesicles; and when these vesicles are removed entire, they shine for some time afterwards; but if lacerated, they are extinguished. The shining substance, the author thinks, is not phosphoric, but monochromatic, and is a gummo-albuminous substance. He thinks, the only use of this insect's lamp is, either as a guide to its food, or as a sign to nightingales where to find their prey. No notice is taken of the old and most rational conjecture, that the light of the apterous female is only a signal to the coleopterous male. The propensity of the males flying towards light, in such numbers as sometimes to cover a table round the lighted candle, in an open room, is a presumptive proof of this last conjecture. Naturalists differ in opinion respecting the existence of the ignis fatuus; and those that admit its existence, differ as to its character; some insisting, as our author does, that it appears "as a glow of lambent flame," while others assert that it is only a luminous fly. It is probable that both phenomena have been seen.

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On the Luminosity of the Sea. — The light of the sea has been ascribed to various causes; by some to phosphorescence, the effect of animal decomposition; to the imbibition of solar light, analogous to the diamond, and to an electric effect induced by friction; while others have more plausibly assigned it to the presence of luminous animals, and of these the Medùs*a* pellùcens, and hemisphérica, Límulus noctilùcus, &c. have been described." This phenomenon, so commonly seen every where, more especially in the Atlantic, under the bows of a ship, or in storms, has been settled long ago; and, no doubt, is caused by phosphorous mollusca floating on the surface of the water. The author claims the discovery, that this appearance on the sea is a presage of a storm; and, if future observations prove it to be so, it may be of the utmost importance to mariners. On this point, his concluding paragraph deserves republication: "We dare scarcely speculate, touching the design of this singular distinction. This much we know, that Almighty Goodness has made nothing superfluous or in vain. The visitation of luminous animals seems connected with meteorological phenomena; and it would be interesting to ascertain, *from different parts of the coast of Great Britain*, what kind of luminous animals generally contribute to the effect."

On the Phenomenon of the Chameleon.—This reptile is an inhabitant of intertropical climates; it belongs to the lizard family, and is particularly remarkable for the varying colours of its skin. Our author's experience of the nature of this animal has been directed to ascertain the cause of these changes, which, he says, "are depicted in such varying shades, that the magic of the necromancer's rod takes not the sense of vision more completely captive than do these ephemeral and sportive hues."

His convictions on this wonderful property are, that the changes are caused by the circulation of the blood of the reptile, and that increased temperature, either of the ambient air or of its own body, produces all the variations of the skin. And, as the passions of the human mind change the colour of the skin as well as the form of the features, and according to the rapidity of the flow of blood, so Mr. Murray thinks that the feelings of the chameleon may also, in some measure, produce analogous changes in the reflecting surface of the skin.

On the Ascent of the Spider into the Atmosphere.—Gossamer has been long noticed by both poets and naturalists. About the beginning of the last century, it was supposed to be condensed vapour. Geoffroy gave it as his opinion, that it was a web spun by the A'carus (tick) telàrius (*tela*, a web), on the north side of trees; and being from thence dispersed by the wind, covers the fields with those innumerable threads! It is now known to be produced by many different kinds of spiders, particularly the flying spiders. Our author has paid particular attention to the economy of these insects, and assures us that they have actually the power of projecting their threads to a considerable distance, and by such means transporting themselves from the ground to any elevation, or from the top of one elevation to another. But what is still more astonishing, he conceives that these threads are electric, or so actuated by that subtle element, that buoyancy is imparted, and the baseless shrouds of the aerial traveller are, with itself, projected aloft into the highest regions of the air!

There are but very few spiders, which, in crawling over uneven surfaces, do not leave behind them a thread, serving as a cable, or rather a line of suspension, lest they should fall, or be blown off from any eminence; consequently, the whole surface of the ground, throughout the summer months, is covered with their network; not only with webs of the ground spider, which may be called personal property, but from innumerable threads of vagabonds. This accumulation creates no wonder, because it is certain that these threads, however delicate, are at the same time durable. But that this tissue is constantly increasing, may be seen by following the plough for a short space: for no sooner has the team finished one land or ridge, but the fresh ground is quickly interlaced with threads, which glisten in the sunbeam. There is no accounting for this, except on the facts stated by the author, viz. that the air in fine weather is filled with the excursive threads of the impennous *Arànea aeronaútica.* The insect is often detected at the end of its thread, with its little arms extended, and balancing itself like a bird, and always proceeding before the wind. This direction of their flight always accounted for the connection between tree and tree, or hedge and hedge; moreover, the insect by its instinctive sagacity, in committing a coil of its thread to the wind, and taking its chance of a distant attachment, could then transport itself in safety. But the author has seen threads projected or propelled in a close room, where there could be no current of air to carry the same in any direct line; and so far the relation is most interesting.

Many curious experiments were made by the author, to prove that electricity, either positive or negative, was an agent in the movements of this spider, and the results go far to establish his hypothesis. This opinion, however, is refuted by J. Blackwall, Esq. in *Lin. Trans.*, vol. xv. part ii. p. 449. who proves that spiders have no power of propelling their webs, without assistance from the wind; and that the cobwebs seen floating in the air, are raised from the surface of the ground, by the action of air highly rarefied by a cloudless sun.

Mr. Murray also thinks that spiders are attracted by musical sounds; but it is more probable that they descend from ceilings, &c. towards an instrument from an impulse of fear, caused by the vibration of the air, than from any relish for melody. In this section of the book the writer has many pertinent remarks on the structure and economy of the insect creation: all showing how important it is to the other branches of animated nature, as affecting vegetation, and even man himself. Insects can, and actually do, change the features of the face of the earth, by creating new stations for the abode, industry, and all the local enjoyments of man. In the greatest depths of the ocean, the despicable zoophyte (*zōon*, an animal, *phyton*, a plant; partaking of both natures) founds its habitations. The most remarkable of these is the coral structure, which, gradually enlarging in dimension, from the bottom upwards, at last rises above the surface of the sea, and becomes in time clothed with vegetation, birds, insects, and all the aggregations of surrounding waters, is at last seized on, and falls under the dominion of man. This idea is beautifully expressed by Humboldt in his *Physionome des Végétaux, Tableaux de la Nature*, p. 11.

On the Torpidity of the common Tortoise. — This is a curious account of the temporary stagnation, or suspension of active life in the tortoise, dormouse, and other animals called sleepers. During this cessation of action in the winter months, it has been proved that the temperature of sleepers is diminished; the circulation of their blood is slower; respiration less frequent, and sometimes entirely suspended; the action of their stomach and digestive organs are also suspended; and the irritability and sensibility of the muscular and nervous powers are diminished. Heat and air are the only agencies which rouse them from their death-like lethargy. This paper contains historical accounts of individual tortoises, which have been kept by some of the English bishops at their palaces. In the library of Lambeth Palace is the shell of one brought there in 1623; it lived until 1730, and was killed by being carelessly exposed to the inclemency of the weather. Another at the episcopal palace at Fulham, procured by Bishop Laud, in 1628, died in 1753. One at Peterborough was known to have lived 220 years! This animal was seen by the author in 1813, and of which he gives an interesting account.

On the torpidity of animals, the author takes occasion to remark, that the lethargy of the toad and lizard may continue without the extinction of life for ages. Both these animals have been found alive imbedded in stone; "a toad was found under the coal seam, in the iron-stone over which it rested, in a coal-mine at Auchincruive in Ayrshire." This circumstance, in the author's opinion, completely invalidates the Huttonian theory of the primitive formation of the earth; and in course shows his belief in that which is called the Neptunian.

M.

Art. II. *Catalogue of Works on Natural History, lately published, with some Notice of those considered the most interesting to British Naturalists.*

Britain.

Curtis's British Entomology. In 8vo Numbers, monthly. 4*s.* 6*d.* coloured.

No. LIII. for May, contains

Apion diffórmis; Coleóptera Curculionídeæ *Latr. Leach.* The type of this genus is the Curcùlio frumentàrius *Linn.*, the Corn Weevil. The plant is the Brássica campéstris, or Field-Cabbage. The following character of the genus is given, in order to enable the learner to apply the terms: —

Anténnæ (*fig.* 59. *a a*) inserted beneath the *nàsus* (nose) (*b*), and before the eyes, not geniculated, and rather long; 11-jointed, the basal joint being the longest, the remainder varying in length; the two or three last forming a club more or less fusiform. *Làbrum* (lip, or tip) none. *Mandibles* (*c*) horny, convex, bent, tridentate; the centre tooth forming the apex, a small one arising on the outer, and a very strong one on the inner side.

Maxillæ (*d*) broad, compressed, forming a large, membraneous, pubescent, and ciliated lobe on inner side. *Pálpi* (patters) (*e*) very short, inserted on outer shoulder; 3-jointed, first and second quadrate, third scarcely visible.

Méntum (*f*) obovate-quadrate, horny, producing a bristle on each side. *Pálpi* (*g*) extremely minute and indistinct, apparently 3-jointed. *Lip* incurved, membraneous, pubescent.

Head elongated into a rostrum (*h*). *Eyes* not very prominent, nor touching the thorax (*i*), which is usually broader than the base of the head. *Scutéllum* very minute, triangular. *Elýtra* (*k*) convex ovate, often twice as broad as the thorax. *Legs* (*l o*) long; *thighs* (*l*) robust, subclavate. *Tibiæ* (*m*) long, not spined. *Társi* (*n*) four-jointed; basal and terminal joints the longest, third bilobed. *Claws* (*o*) distinct.

The specific description of Apion diffórmis is thus given: —

" Shining, blackish green. Rostrum long, the anténnæ inserted beyond the middle, fulvous, the base and apex black; second joint very minute; third transverse, compressed, cup-shaped; fourth robust, scutiform, compressed; four following of nearly equal length, the fifth and sixth being much more robust than the seventh and eighth, the remainder forming a club, the ninth being turbinate and distinctly articulated, the other two being firmly united and conical (*p*). Head coarsely punctured between the eyes, the basal collar smooth. Thòrax subquadrate, narrowed anteriorly, coarsely punctured, with a channel on the back, deepest at the base. Elýtra very convex, narrowed towards the apex, with six deep loosely punctured striæ on each. Epigástrium with a bifid tooth (*q*). Legs fulvous, base and apex of thighs and base of anterior tibiæ black, with two obscure spines at the apex; four posterior tíbiæ (excepting a space above the middle) and the társi black. Anterior társi, with the basal joint (*n*), long, and very much produced internally at the apex, which is brown; posterior tíbiæ greatly dilated at their apex as well as the társi, especially the basal joint."

Seventy-two British species are enumerated, all of them small.

Mágdalis carbonàrius, the type of which is the *C*urcùlio *c*érasi of Linnæus. Four species are enumerated as found on different species of *P*rùnus, and on the birch and hazel. —Penthóphera nígricans; Lepidóptera *B*ombycìdæ. Type of the genus, *B*ómbyx mòrio *Lin.* The plant is the *L*òlium perénne, or Rye Grass, on which the larva of this insect feeds.

Pímpla æ'thiops (*fig.* 60., the female); Hymenóptera *I*chneumonìdæ. Type, *I*chneùmon manifestàtor *Lin.* The plant is the *B*ùtomus (*bous*, an ox, *temno*, to cut; eaten by cattle bleeds their mouths) umbellàtus, the Umbellate, or Flowering, Rush, one of the most beautiful of water plants, and one of those on which the A'rctia cœnòsa feeds.

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Stephens's Illustrations of British Entomology. In 8vo Numbers, monthly. 3*s.* 6*d.*

No. XIII. for May, contains

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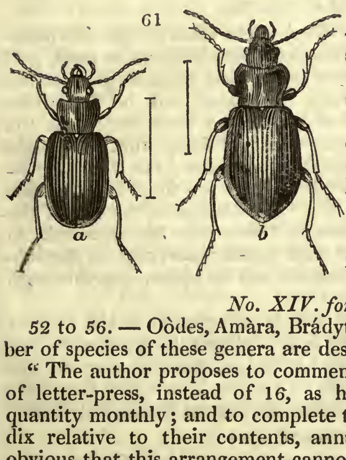

a *b*

43 to 51. —Pœ'ciles, several species. — Sogìnes punctulàtus. — Omasèus, 9 species.—Stòmis pumicàtus.—Pátrobus rùfipes and alpìnus. — Pteróstichus, 7 species; one of which, P. màcer (*fig.* 61. *a*), abounds in Hackney marshes, and other places, under the bark and roots of trees, beneath stones, &c. Another, P. octopunctàtus (*fig.* 61. *b*), is rare, Mr. Stephens having seen only three specimens; one at the British Museum, a second in the collection of Mr. Vigors, and the third in his own.

No. XIV. for June, contains

52 to 56. — Oòdes, Amàra, Brádytus, Curtonòtus, and Tàbrus. A number of species of these genera are described, and six figured.

" The author proposes to commence, on the 1st July next, with 32 pages of letter-press, instead of 16, as heretofore; to continue, at least, that quantity monthly; and to complete two volumes, with an index and appendix relative to their contents, annually, on the 1st of June. But as it is obvious that this arrangement cannot be carried into effect without considerable increase of expense, the price of each number, from the above period, will be advanced to five shillings; and in order to render the volumes now in progress, of equal bulk and value with the succeeding, a supplementary number, containing about 100 pages of letter-press, illustrated with three figures of lepidopterous insects, will be published on the 30th June next, completing the description of the Harpalìdæ, the Diúrna, and the Crespusculària, the price of which will be eleven shillings. And, as the printing of the author's *Systematic Catalogue* is rapidly proceeding, and the catalogue itself is drawing to a close, the author is now enabled to make a more correct statement of the extent of this work. He therefore undertakes to complete, as far as practicable, the description of the insects enumerated in his catalogue in 135 numbers, including the 12 already published, so that his labours will cease in ten years; and he trusts, that the regularity with which the work has hitherto appeared, and the circumstance of his having already exceeded the stipulated quantity of plates and letter-press, combined with the contents of the volumes now before the public, will be received as pledges of the fulfilment of his intentions, so far as rests with himself.

"The advantages resulting from the arrangements are evident; as the entire work, although containing the same quantity of matter as at first proposed, will not only be completed in half the period it would otherwise have occupied, but the aggregate expense will be diminished about one third; and no less than 104 genera of insects, including the descriptions, &c. of nearly 600 species, will be finished in fourteen months, illustrated with 98 figures, embracing 80 mostly very rare species; 54 of Coleóptera, and 26 of Lepidóptera; and, for the future, nearly every tenth species will be figured, and about 800 described annually.

"Finally, the author begs to refer his readers to the review of his first eight numbers, in No. XI. of the *Zoological Journal*, and in p. 472. of Vol. IV. of the *Introduction to Entomology*, as unprejudiced testimonials of the character of his work." (*Advert. on Cover of No. XIII.*)

Bennet, John Whitchurch, Esq. F.H.S., and Member of the Literary and Agricultural Society of Ceylon: Fishes of Ceylon; a Selection of the most remarkable and interesting of the Fishes found on the Coast of Ceylon, from Drawings made in the Southern Parts of that Island, from the living Specimens. London. 4to, 5 pls. One Guinea. To be continued monthly, and completed in Six Numbers.

In the prospectus it is stated, that, in Ceylon, the fishes are not less beautiful in appearance, than they are for the most part delicious as food, and that of many of them neither drawing nor description has been given to the public. The plates of Mr. Bennet's work, it is stated, will be "accurate fac-similes of the original drawings, all of which have been made from the living fish. Several of these specimens are so extraordinary, that they might be taken for mere creatures of the artist's imagination; but they will be accompanied by a certificate from the head men of the Fisher's Caste affirming them to be correct delineations. The descriptive portion of the work will combine such local information as the author has been able to collect, with so much as can be gleaned from preceding writers on the subject. The Cingalese name of each specimen will be given, together with the Linnean, wherever it can be obtained.

"In order that the greatest accuracy may be attended to in the number of ràdii in the fins and gill-covers of the fishes delineated, those particular parts, prepared in a dry state, and classed in boxes, together with the original drawings, agreeably to the numbers of the work to which they have reference, may be seen at Mr. Morris's office, 30. Regent Street, Pall-Mall."

The contents of No. I. are:

1. *S*corpæ`na (*skorpios*, a scorpion; supposed power of inflicting incurable wounds) vólitans (*volito*, to fly about). The native name of this fish is Great Fire, from its colour. The essential specific character is, "pectoral fins (*fig.* 62. *a*) longer than the body." The description is as follows:—

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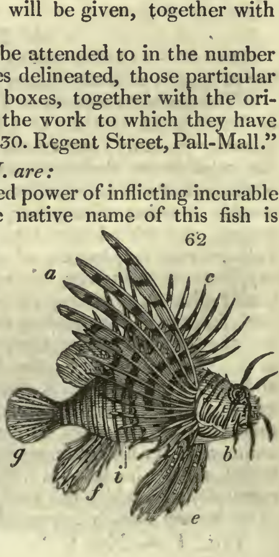

Branchiostegous (*bránchiæ*, gills, *stegē*, a covering) rays (*b*) six. Dorsal (*dorsum*, back) (*c i*), twenty-four, thirteen of them spinous, varied with black and reddish-brown; the colours stronger on the spinous rays than on the others. Pectoral (*pectus*, the chest) (*d*), fourteen; the connecting membrane bluish and brown. Ventral (*venter*, the belly) (*e*), six, one spinous, bluish, spotted with white. Anal (*anus*) (*f*), ten, three spinous. Caudal (*cauda*, the tail) (*g*), twelve. "Although Linnæus, in naming, as well as in his descriptions of this animal, would make it appear to be possessed of the power of flying, the membranes of the pectoral fins are not, to appearance, sufficiently united or proportioned to the body to admit of volitation; and, indeed, the native fishers confirm this position."

2. Acanthùrus (*akantha*, thorn, *oura*, tail; appearance) vittàtus (*vitta*, a band; stripes). A splendid fish, covered with dark and light blue and yellow stripes.

3. Gomphòsus fúscus. Singular.

4. Holocéntrus (*holos*, all, *kentron*, a spur; appearance) rùber. "For splendour and beauty this fish is considered, by many, to surpass the gold fish of China."

5. Chæ′todon (*chaite*, a bristle, *odous*, tooth; form) vespertílio (*vespertilio*, the bat; resemblance).

Essential specific Character.— Dorsal spines (*fig*. 63. *a*) five. Dorsal and anal fins (*b c*) broad. Caudal fin (*d*) with a brown band (*e*).

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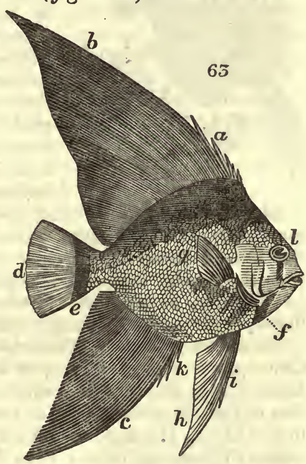

Description. Branchiostegous rays (*f*) four. Dorsal (*b*), forty-two, five spinous (*a*). Pectoral (*g*), fifteen. Ventral (*h*), six, one (*i*) spinous. Anal (*c*), thirteen, three (*k*) spinous. Caudal (*d*), sixteen. *Head* without scales, iris (*l*), golden; mouth small, lips thick, lateral line arched.

"This species of Chæ′todon is scarce on the southern coast of Ceylon; and being considered by the native fishers unwholesome, from a sort of food to which it is partial, as well as to the copper of ships, is never made use of. It attains a very large size, and is called Kola Handah, Leaf Moon, by the natives, from the resemblance it bears in the dorsal fin to the leaf of a marine plant; and, in the shape of the body, to that of a moon." To those who are curious in fishes, this work must afford a rich treat; it is executed in the very best manner, and not high priced, considering the splendour of the engravings.

Botanical Periodicals.

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The Botanical Magazine, for May, contains Zygopétalon (*zygos*, a pair, *petalon*, a petal) rostràtum. (*fig*. 64.) An orchideous epiphyte, of which only one other species has been figured; and both by Dr. Hooker, the founder of the genus. "The credit of introducing this fine plant, from Demerara to the Liverpool botanic garden, is due to C. S. Parker, Esq."— Cáctus alàta (*fig*. 65.) is a curious species sent from the Organ Mountains, near Rio Janeiro, by William Harrison, Esq., of Rio, to the rich collection of his sister, Mrs. Arnold Harrison, of Aigburgh, near Liverpool. The entire plant grows from 1 ft. to 2 ft. high, in a proliferous manner. (*fig.* 65.) For the sake of our inexperienced readers, we shall give Doctor Hooker's description: — "Joints (*fig.* 65. *a* to *b*) from 4 in. to 6 in. in length, oblong, remarkably compressed; varying in breadth, from 1 in. to 3 in.; the margins slightly thickened, crenato-lobate, everywhere glabrous. There is a distinct mid-rib (*fig.* 66. *c*) running through the centre of these, and bundles of vessels forming lateral thickened nerves or ribs, leading off from it, and extending in a curve, whose convexity is uppermost (*d*) to the crenatures. The colour of the plant is rather a dark green, the ribs and margin often reddish. Flowers (*fig.* 66. *e*) numerous upon the joints, solitary in each crenature, small, and not unlike those of the Rhípsalis tribe. The base is occupied by the germen (*f*), which is nearly spherical, pale green, and smooth. Calyx (*g*) of three small, oval, concave, brownish, scariose leaflets, but gradually becoming larger and more petaloid, and passing almost insensibly into the five pale yellowish-green spreading petals (*h*); tube none. Stamens (*i*) numerous, inserted within the united bases of the calyx and corolla. Filaments (*k*) rather longer than the corolla, and white. Anthers (*l*) didymous, yellowish white. Style (*m*) filiform, as long as the stamens; stigmas (*n*) four, or generally five, linear, recurved, pubescent, white.

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Dioscòr*ea* (*Pedacius Dioscorides*, a Greek physician) *c*innamomifòlia, the Cinnamon-leaved Dioscorea, or Yam, is a native of the woods about Rio de Janeiro, also sent to this country by Mr. Harrison. It deserves the attention of the young naturalist, not only as being the potato of tropical climates, but as having the male and female flowers on different plants, and consequently belonging to the class Diœ'cia (*dis*, twice, *oikos*, a house) of Linnæus, and to the order of this class Hexándria, as having six stamens. Sprengel, and other moderns, however, who propose not to take the circumstance of the sexes being in different plants, into consideration in forming the classes, but to be guided entirely by the stamens and pistils, refer Dioscòr*ea* to Hexandria Monogýnia. This genus and one or two others form a natural order of themselves, the type of which being Dioscòr*ea*, the order, in conformity to a fundamental rule, alluded to (p. 36.), is called Dioscòr*eæ*. Only the male plant (*fig.* 67.) is yet known. The following is its description by Dr. Hooker. "Root a roundish, ill-shapen tuber, as large as the human head. Stem (*a*) twining, branched, striated, pubescenti-hirsute, hairs brownish: whole plant destitute of prickles; leaves alternate, petiolate (*b*), oblongo-acuminate, quite entire, of a texture between coriaceous and fleshy, shining, having three distinct nerves or ribs (*c*), which are prominent on the under side, where the leaf is of a paler green, and where, near the base, are some dark dots of glands: the margin itself, when held between the eye

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and the light, is seen to have a thin pellucid margin. Petioles (*d*) from three fourths of an inch to an inch long, hairy like the stem. Male racemes (*e*) apparently always solitary, axillary, hairy, often compound at the base: pedicels (*f*) branched, each with a lanceolate bractea (*g*). Perianth (*h*) cup-shaped, deeply six-partite, the segments (*i*) spreading, oblong, yellow-green. Stamens (*k*) six, opposite to the divisions of the perianth."

The Botanical Magazine, for June, contains *C*ȳcas circinàlis (*circus*, a circle; ring-like joints of the trunk). A palm well known in the Molucca Islands, where the fruit is eaten, and sago said, but erroneously it is believed, to be taken from the trunk. The leaves of this palm are used by the Thomæan Catholics of Malabar, as those of the date palm (*P*hœ'nix dactylífera) are by the Catholics of Europe, on Palm Sundays, and by the Jews on the feasts of the Passover. In a botanical point of view, the *C*ȳcas circinàlis is interesting, as forming the connecting link between Monocotylèdones and Dicotylèdones. " Linnæus ranked the *C*ȳcas among the palms, but observed, ' Foliatio circinalis more Filicum peragitur' [It puts forth a circular foliation after the manner of ferns]; Jussieu and Ventenat, along with the ferns; Jacquin, in an artificial system, considered it to belong to the class Diœ'cia, and order Polyándria; Smith looked upon it, along with Zàmia, as constituting an intermediate order between the *P*álmæ and the *F*ílices. In Persoon's *Synópsis*, the natural order *C*ycàdeæ is established; and the place of it suggested, corresponding with the ideas just mentioned of Sir James Smith. Our learned countryman, Mr. Brown, in his inestimable *Pródromus Flòræ Nòvæ Hollándiæ*, has placed the order the last of the Monocotylèdones, immediately before the Dicotylèdones; calling the embryo, indeed, pseudo-dicotyledonous. The true structure of this embryo is now completely ascertained by the labours of Du Petit Thouars, and the late admirable Richard, and this latter has determined it to have the closest affinity with the dicotyledonous plants; and amongst them, with the Coníferæ, near which he consequently places the order. Here, however, it must be acknowledged, that the natural habit and aspect of the vegetation are sacrificed to minute differences in the fructification. In the structure of the stem, in the mode of growth, in the situation and appearance of the leaves, the *C*ȳcas has the closest affinity with the palms, and is in these particulars as far removed as can be from the pines." Francís*cea* (Francis, Emperor of Germany) Hope*àna*, (Mrs. Thomas Hope of Deepdene) (*fig.* 68.); Scrophularíneæ. " A most interesting and desirable plant; for not only are the flowers of a rich purple blue colour, but they are excessively fragrant." *Œ*nothèra Lindlèy*ii*, introduced by Mr. David Douglas, from the north-west coast of America, and the specific name given, at his request, in honour of John Lindley, Esq. F.R.S. L.S. &c., recently appainted botanical professor in the London University.


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The Botanical Register, for May, contains Agàve geminiflóra (figured in *Gard. Mag.*, vol. ii. p. 96.), Twin-flowered Agàve. A South American liliaceous plant, with rush-looking leaves, and a flower stem which has grown as high as 24 ft. at Lainate, near Milan, and 14 ft. high in Mr. Knight's nursery in the King's Road. " In the gardens both of this country and of the Continent, it was, before flowering, confounded with Buonapárte*a* *j*úncea, a totally different plant, resembling this in nothing but the nar-

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rowness of the leaves, which are otherwise so different, that no person who possessed the slightest acquaintance with the natural affinities of plants could have fallen into the mistake. But at that time botany was too often mere empiricism, a stigma from which it has not yet recovered in this country. The botanist of artificial arrangements could do nothing without his stamens and styles; but, for the student of nature, no better evidence upon this plant than the leaves offered would have been desired, to determine whether or not it was a Buonapárte*a*." Agàve belongs to the natural order Amaryll*ídeæ*, Buonapárte*a* to Bromel*iàceæ*.—Polýgala oppositifòlia var. màjor (*fig*. 69.), Amarýlli*s* intermèdia, *L*upìnus lépidus (one of the smallest of perennial lupines) and *G*enísta procúmbens are also very pretty flowering plants, and *C*ratæ`gus cordàta (*fig*. 70.) is a handsome hardy American tree, valued for its dark glossy leaves, and brilliant scarlet fruit, which will sometimes hang on the tree during the entire winter.

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The Botanical Register, for June, contains Calochórtus (*kalos*, handsome, *chortos*, a kind of grass; beautiful flowers borne by grassy herbage) macrocárpus (*makros* long, *karpos*, fruit; the fruit of other species is short and roundish) (*fig*. 71.); 6 and 1, and *L*iliàceæ. A fine plant, with purple flowers, resembling in its general appearance Tigrídia pavònia.—*P*ỳrus grandifòlia, a new species from North America.—*O*'rchis papilionàcea, from the south of Europe.—Tillánds*ia* acaùlis; 6 and 1, and Bromel*iàceæ;* introduced by Mrs. Arnold Harrison.—Gesnèr*ia* rùtila, imported from Brazil by the Comte de Vandes.

72

The Botanical Cabinet, for May, contains Cypripèdium insígne (*fig*. 72.) A beautiful orchideous bulb, from Nepal, of which Messrs. Loddiges observe, "There is something fascinating about this plant, as well in form as in the arrangement of its colours; delightful to every eye, but doubly so if we view it as formed by the kindness of God."—Potentílla spléndens, an almost hardy perennial, also from Nepal, and to which the specific name of spléndens is given, on account of its fine silvery leaves.

*S*empervìvum tabulæfórme (*fig.* 73.) is a curious succulent plant, and Digitàlis canariénsis and Azàlea calendulàcea are highly ornamental. The handsomest plant in this periodical for May is Isopògon *a*nemonifòlius. (*fig.* 74.) A pretty greenhouse shrub, of dwarf growth, producing its heads of flowers very freely during the summer months.

74

73

Flòra Australásica, for May, contains Hàke*a* ferrugínea, a stout-growing, bushy, evergreen shrub, from the collection of Robert Barclay, Esq. at Bury Hill, and not before described. — Lechenaúlt*ia* oblàta, a charming heath-like bush, with fine orange flowers. — Leucopògon (*leukos*, white, *pōgōn*, a beard; the limb of the corolla being bearded with white) lanceolàtus (lance *leaved*) (*fig.* 75.), which Mr. Sweet has thus described: " A small branching upright evergreen shrub; branches slender, smooth, well clothed with leaves. Leaves alternate, sessile, linearly or narrowly lanceolate acute, but not mucronate, flat, generally 3-nerved, except a few of the largest, which are 5-nerved, striated with numerous lines of a pale green on the upper side, and slightly glaucous underneath. Flowers white, sweet-scented Spikes axillary (*a*), and terminal (*b*), a little nodding, aggregate, 10 to 15-flowered. Peduncles (*c*) smooth, purple. Bractes (*d*) smooth, ovate, concave, scarcely acute, two embracing the calyx, and one clasping it at the base. Calyx (*e*) 5-parted, smooth: laciniæ ovate, concave, with thin white membranaceous margins. Corolla (*f*) funnel-form; tube short, inflated: limb 5-cleft, the laciniæ about half the length of the tube, linear, acute, revolute at the points, densely bearded with white hairs. Stamens (*g*) five, inserted in the mouth of the tube, and alternate with the laciniæ: filaments (*h*) very short, included. Anthers (*i*) linear, exserted. Germen (*k*) smooth, slightly conical. Style (*l*) smooth, tapering upwards, included in the tube. Stigma (*m*) slightly capitate."

75

76

The Flòra Australásica, for June, contains *A*càcia *m*yrtifòlia; Leguminosæ Mimòseæ. — Styphèlia viridiflòra; Epacrídeæ. — Bossi*æ*'*a* ensàta; Leg. Pap. Lòteæ Genísteæ. (*fig.* 76.) A flat-branched plant, leafless when in flower, but leafy when young. — Pimelèa drupàcea. All these are new and handsome plants.

The British Flower-Garden, for May, contains four showy hardy plants, and among them Rhododéndron arbòreum, which grows 20 ft. high, is covered with heads of brilliant scarlet blossoms, and must be one of the most splendid of vegetable productions when in full flower.


77

The Number for June contains figures of some very handsome plants, the newest of which is Cinerària aurantìaca. (*fig.* 77.) Very beautiful in regard to colours; the flowers in corymbs; at first of a bright orange brown, changing to a dark orange, afterwards becoming golden yellow, orange-coloured underneath, and very sweet-scented.

Maund's Botanic Garden, for May, contains *Liàtris* (meaning unknown) scariòsa (scarious, in allusion to the calyx), a fine purple-flowering, autumnal plant; and *Cárthamus* (*quortom*, to paint, *Arab.*; red paint prepared from stamens) tinctòrius (*tinctorius*, dying, from *tinctura*, a dye; in allusion to the colouring principles of its flowers). The florets are gathered when they begin to expand, and dried on a kiln, for future use in dying. Pink saucers and vegetable rouge are prepared from these flowers, which may be purchased from druggists under the name of safflower, in the following manner: — "Wash safflower till no stain is given to the water, and then dry it. Of this take half an ounce; infuse it a short time in a pint of water, in which a dram of the subcarbonate of soda has been previously dissolved; strain off the liquid, to which add an ounce of finely levigated French chalk. The alkali will hold the colouring matter of the safflower in solution, and the chalk will remain colourless; but, by adding a little tartaric or citric acid, the alkali will be neutralised, and the red colouring matter, which is not soluble in simple water, being set at liberty, will fall to the bottom, combined with the chalk. Thus a beautiful pigment is produced, which may be dried and further levigated for spreading on saucers; or, ground with a drop or two of olive oil, will form the Spanish or vegetable rouge. Liquid pink dye is a similar preparation, with a portion of spirit of wine." This periodical, for June, contains Saponària ocymöìdes, Calceolària pinnàta, *Verónica* urticifòlia, Diánthus japónicus; all very handsome plants.

The Scientific Journals.

As these periodicals contain many valuable articles on natural history, we intend noticing them regularly as they appear, for the sake of referring to the articles. Of *Brande's Quarterly Journal* a new series was commenced above a year ago, with the avowed intention of rendering it more suitable for general readers; and, in this respect, it is certainly greatly improved. No. V., for April, contains the natural history of the Earwig, by our correspondent, Mr. Main, who has shown that the weapon-like appendages at the end of the abdomen are not so much intended for defence or offence, as for folding and unfolding the wings of the insect; and that the vulgar notion of this creature entering the human ear is not founded on fact: anatomists, he says, deny it; and he adds, with the true feeling of a naturalist, "it is a pity that this is not generally known, as it might defend the constitutionally timid from unnecessary alarm, and give a more favourable idea of that part of the animal creation, which forms a most necessary link in the chain of being." Achatinélla (dim. of *achatēs*, an agate; resemblance), a new group of terrestrial shells, is described by another of our correspondents, Mr. Swainson; the orchideous genus Macræ'a, from Chile, by Professor Lindley. Under miscellaneous intelligence are thirteen notices from the *Bulletin Universelle, Jamieson's Journal, Brewster's Journal,* the *Annales de Chimie,* &c.; the most interesting of which, as it appears to us, is a notice from the *Bulletin Universelle* of a disease of silkworms, and its cure. In the south of France, silkworms very often become yellow from the attacks of a malady called the jaundice. The remedy there is what gardeners in Britain would adopt, as a destructive power, in the case of worms of any kind; but in France it is said to have been employed for twenty years with perfect success. It consists in powdering the worms with quicklime, by means of a silk sieve, and then giving them mulberry leaves, moistened with a few drops of wine. The safety of the worms under the powdering of quicklime depends, no doubt, on the absence of moisture.

The Philosophical Magazine and Annals of Philosophy, for May and June, contains some interesting philosophical articles, and full accounts of the proceedings of several societies.

Gill's Technological Repository, for May, contains the continuation of a very interesting series of microscopical observations, some curious remarks on the cocoa-nut, and the mode of cultivating it in the East. In the June number the microscopic article is continued, and some farther observations on the culture of palms, scitamineous plants, and the black pepper, in the East, taken from *Buchannan's Journey from Madras.*

Brewster's Journal for April contains:— Notice of Meteorological Phenomena at Patna,in the East Indies. — Observations on the formation of Ice in India, by which it appears that the opinion "repeated by one author after another," that ice is formed by evaporation from porous pans, is erroneous. "The fact is, that the natives use porous pans from necessity; but so well are they aware that the porosity of the vessels is of no advantage, that they usually rub them with grease," as the writer supposes, to admit of more easily extracting the ice, and to keep the straw, in which the vessels are placed, in a perfectly dry and non-conducting state. The only author who understands the subject is said to be Dr. Wells. The writer has repeated the experiments mentioned by Dr. Wells in his *Treatise on Dew,* "and sometimes with singular results," all proving that the ice is produced by radiation into a clear atmosphere. The writer, David Scott, Esq., never found it practicable to make ice when the temperature exceeded 41° on the level of the pits. — On the Natural History of Tabasheer, the siliceous concretion in the Bamboo, by Dr. Brewster.— An Account of a New Sea Serpent, or serpentiform fish (*fig.* 78.), by Dr. Harwood, Professor of Natural History in the Royal Institution. It was found in Davis's Straits, is 4 ft. 6 in. long, with a purplish-black granular skin, small fins, and a slender tape-like tail, which is continued 1 ft. $8\frac{1}{2}$ in. beyond the extremity of the dorsal fin. Dr. Harwood has given it the name of Ophiognàthus ampullàceus, or bottle-like. — Account of the Tracks of Footmarks of Animals, found impressed in Sandstone, in the Quarry of Corncockle Muir, Dumfries-shire, by the Rev. Dr. Duncan. These footmarks were discovered fifteen or sixteen years ago; and, what shows the comparative indifference of past times to geological pursuits, their existence has never before been noticed in any scientific

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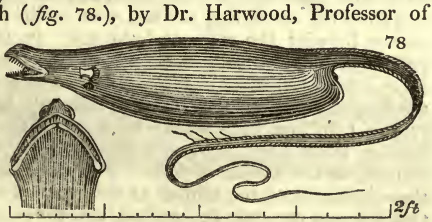
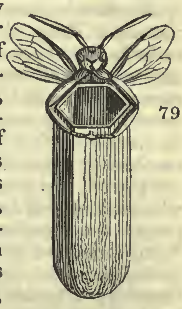


work. The foot-prints differ in size from that of a hare's paw to the hoof of a pony. On a slab forming part of the wall of a summer-house in Dr. Duncan's garden at the Manse of Ruthwell, there are 24 impressions, 12 of the right feet, as many of the left, and, consequently, six repetitions of each foot. Professor Buckland, with whom Dr. Duncan is in correspondence, considers that the animals must have been crocodiles or tortoises. — On the supposed Changes in the Meteorological Constitution of the different parts of the Earth during the Historical Period, by Professor Schow of Copenhagen. This is a very interesting paper, but does not admit of abridgment. The author estimates the climate of different countries in remote periods of antiquity, by the plants mentioned in the Bible and other ancient works, as growing in them, as compared with the fossil remains of the antediluvian world. The paper is not completed, and therefore we cannot give his general conclusions. — Zoological Collections. Three species of bears, natives of India, are described, the crocodiles of the Ganges noticed, and an account of the white elephant of Siam, and of a fight between a tiger and an elephant, from *Finlayson's Mission to Siam and Thibet.* From these notices our readers will see that *Dr. Brewster's Journal* is of very great interest, even as a magazine of natural history.

When the papers on chemistry, comparative anatomy, natural philosophy, and other branches of science, and the high scientific character of the conductor and his coadjutors are considered, it may safely be pronounced a periodical of first-rate merit.

Jameson's Philosophical Journal for April, contains: — Observations on the large brown hornet of New South Wales; a very curious and interesting paper, in which, among other things, the author supposes that the hexagonal plan of the cells is derived from the structure of the fore-legs of the hornet (*fig.* 79). — Analysis of a sour clay, used in acidulating sherbet, in Persia. The whitish-grey earth here alluded to, is found on the margins of sulphurous streams which issue from the bases of hills near Dalkee; it has a sour milky taste, and consists principally of sulphate of lime, with a little siliceous matter, acidulated by free sulphuric acid. — On the Natural History of the Salmon, by Daniel Ellis, Esq. There are seven species of the genus *Sálmo* in the river Tay; but this paper is confined to the *S.* sàlar, or common salmon,



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and treats of spawning and the evolution of the ova in the higher parts of rivers and streams; of the growth and movements of the young brood to and from the sea during the first year of life; and of the migration of the salmon betwixt the river and the sea. In this very complete paper, it is proved that the grilse, which used to be considered as a fish of a different species from the salmon, is but a salmon in a certain stage of growth. For the first thirty-three months of a salmon's life, it increases nearly at the rate of 1 lb. 1 oz. per month; but in the first five months of its existence, that is, from April to August inclusive, it attains, in favourable circumstances, to the weight of 8 lbs. From a great number of facts respecting the migrations of the salmon at different periods of its life, it would appear that the ova can only be hatched, and the young fish live, in fresh water; that in the earliest period of a salmon's existence, salt water is fatal to it; that the causes of the alternate migrations of salmon are two — the search for food, and the impulse of propagation.

[The Rev. Mr. Hendrick, in his *Survey of Aberdeenshire*, assigns another cause, the annoyance of insects which live on their skin.] It is certain salmon receive a principal part of their food in the sea; that the best are always caught in or near the sea; and that they fall off in their condition, in proportion to their abode in rivers.—On the Temperature of the Interior of the Earth, by M. Cordier, Professor of Geology in the Garden of Plants at Paris. From experiments in mines, this writer is convinced that a subterranean heat exists, which is peculiar to the terrestrial globe, does not depend on the solar rays, and increases rapidly with the depth.—Note on Swallows; by which it appears that oiling or soaping the corners of the windows where they build, will deter them from doing so. — On the Domestication of Mammiferous Animals, by M. Frederick Cuvier. (Taken from the *Mémoires du Museum d'Histoire Naturelle.*) It appears that what we call the domestication of animals, consists in our becoming members of the society which these animals form among themselves. Man becomes the chief of its herd; from the moment that an animal admits man as a member of its society, it is domesticated, — "as man could not enter into such society without becoming the chief of it." Applying these principles to wild animals, the apes and monkeys, notwithstanding their social instinct and intellect, are yet so violent and irritable, as to be incapable of all useful subjection. Among carnivorous animals, the seals, together with the various species of the dog tribe, would be the best adapted to attach themselves to us, and serve us. M. Cuvier suggests, that the seal might be trained for fishing, as the dog is for hunting. Several animals peculiar to South America, having but very feeble means of defence, will, as that country is peopled, gradually disappear from the face of the earth. After other illustrations, the writer concludes, that all domestication is founded on the propensity which animals have to live together in herds, and to attach themselves to one another. "We obtain it only by enticement, and principally by augmenting their wants, and satisfying them. But we could only produce domestic individuals, and not races, without the concurrence of one of the most general laws of life, the transmission of the organic or intellectual modifications by generation. Here one of the most astonishing phenomena of nature manifests itself to us, the transformation of a fortuitous modification into a desirable form; of a fugitive want into a fundamental propensity; of an incident habit into an instinct. This subject is assuredly worthy of exciting the attention of the most accurate observers, and of occupying the meditations of the most profound thinkers." The Geology of Nithsdale, by J. S. Menteath, Esq. jun.: a paper valuable in an economical point of view. — On the Causes of the Difference of Temperature on the Globe, by Baron Humboldt, being an extract from a public lecture delivered in the Royal Academy in Berlin. "The differences of climate," this distinguished philosopher observes, "manifest themselves in the character, in the civilisation, and perhaps even in the development of the language of different tribes of the human race." — Account of a *Sìren lacertìna* (*fig.* 80.), which has been kept alive at Cannon Mills, near Edinburgh, by Patrick Neill, Esq. This reptile was sent from the marshes of South Carolina to Dr. Munroe, in 1825, who soon after confided it to Mr. Neill, who kept it in a box of water and moss in his greenhouse, till April, 1827, when it was put in a hot-house; there it became more lively, and began to croak like a frog. It lived on earthworms, but did not care for food oftener than once in a week or ten days; it lived several hours at a time out of water, or several hours at a time under water, at pleasure, being truly amphibious, and capable of breathing either by means of external bránchiæ, or internal lungs. — Tour by G. A. W. Arnott, Esq. to the South of France. — On the Irritability of the Sensitive Plant, by M. Dutrochet. This distinguished physiologist refuses to

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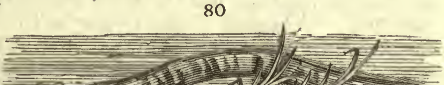


admit sensibility in vegetables, but uses as a substitute for that term *nervimotility.* Light he considers as the external agent, from the influence of which vegetables draw the renewal of the conditions of their irritability, or more generally of their *motility.* — Under the head of Scientific Intelligence, a long extract is given from a valuable paper, by a correspondent of ours, in *Brande's Journal,* on the Chinese Method of fattening Fish; and some other papers on Natural History, and a number on other departments of philosophy, complete the contents of this very interesting Journal.

Floyd, William, Gamekeeper to Sir John Sebright, Bart.: Observations on Dog-breaking. London. Pamph. 8vo, pp. 23. 2*s.* 6*d.*

This little pamphlet contains a few short but excellent rules for breaking in pointers or spaniels. Any dog that will hunt for game may be taught to point by proper training; should never be hunted where there are hares, until they are perfectly steady to partridges; should be taught to lie down at command, and not to rise till touched by the hand. It is easy to check dogs that are too resolute; but, when overawed, they become difficult to manage, and very liable to blink. Slight punishments, frequently repeated, are more effectual than too much severity at once. All pointers should drop when a bird rises; not be allowed to run up to a falling bird. If the word "down" be given when a bird rises, he will soon take the rising of the bird as the signal to drop; and, in time, the scent will be the signal at which he will lie down, this being all that is wanted. Whatever is soon learned by a dog is soon forgotten; and it is only by time and patience that an animal can be confirmed in the habits which it is wished he should retain.

Horsefield Thomas, M.D. F.R.S. L.S. & G.S. Member of the Royal Asiatic, and of the Zoological Societies of London, and of the Imperial Academy Naturæ Curiosorum; Corresponding Member of the Academy of Natural Sciences of Philadelphia, and of the Historical Society of Pennsylvania, &c.: A Descriptive Catalogue of the Lepidopterous Insects contained in the Museum of the Honourable East India Company, illustrated by coloured Figures of New Species, and of the Metamorphoses of Indian Lepidoptera, with Introductory Observations on a General Arrangement of this Order of Insects. London. 4to. Part I. 1*l.* 11*s.* 6*d.* To be completed in Six Parts.

In the introduction, the author informs us, that his object is to describe a series of lepidopterous insects, which form part of a general entomological collection from Java, contained in the Museum of the Honourable East India Company. The work will be conducted with a steady reference to his *Annulòsa Javánica,* and the *Hòræ Entomològicæ* of William Sharp Macleay, Esq. "The plan of the former will be my constant guide, and the comprehensive views detailed in the latter will afford the means of regulating the arrangements suggested by the former, and of comparing and correcting my mode of proceeding. Accordingly, my principal aim will be to discover the natural affinities, and to follow them in the arrangement. Wherever my materials are sufficiently extensive, I shall trace the series through its whole extent, and endeavour to show, that in this department also, the principle so clearly developed by Mr. Macleay, is exemplified in the succession or chain of affinities returning into themselves, or forming circles. In the series which will thus be submitted to my close examination, I shall endeavour to discover and point out the typical forms which indicate the subdivisions, and distinguish the groups. But, as it may be expected that, in a local collection, many forms must be deficient, and the thread of affinities often interrupted, I shall carefully notice these interruptions, with the design of supplying them, as far as necessary, from other sources of information. The analogies existing between objects of distant or of neighbouring groups will also be pointed out, wherever they may have been satisfactorily developed." (p. 3.)

The author mentions an attempt at an arrangement of Lepidóptera, according to their metamorphoses, by Messrs. Denis and Schieffermüller, of Vienna, as harmonising with the circular or quinary system of M'acleay. According to this system all the Lepidóptera may be referred to one or other of the following types of form, viz. *P*apilionìdæ, Sphíngadæ, *B*ombycìdæ, *N*octùìdæ, and *P*halænìdæ. Some remarks are next given on eachof these tribes, and the descriptive catalogue commences with the character of *P*apilionìdæ, and its different branches (stirpes), and the genera formed from them. Four coloured plates exhibit some of the more remarkable species and their members, in the larva, chrysalis, and perfect state. These plates are beautifully engraved and coloured, and the work may be considered as highly scientific, and a most valuable contribution to entomology.

Kent, ***Miss***, Authoress of Flora Domestica, and other Productions, literary and botanical: Sylvan Sketches: or, a Companion to the Park and the Shrubbery: with Illustrations from the Works of the Poets. London. 8vo, pp. 408. 12*s*.

It is the intention of this volume " to give an unceremonious introduction of certain trees and shrubs " to such as are " occasionally in the habit of meeting them without being acquainted, in many instances, even with their names. Botanical language has been carefully avoided; for, although it would often have saved many words, it was considered that such terms would be intelligible only to botanists; and that the botanist was precisely the last person to whom a description of common trees and shrubs would be likely to be of any use." After an eloquent introduction in praise of the subject, and illustrative of the beauty and utility of trees, an alphabetical arrangement is commenced, and all the hardy trees and shrubs, commonly met with in parks and gardens, described in general language, and treated of historically and poetically. In addition to the systematic name, is given the Linnean class and order, the order according to the natural system, and the synonyms in English, Scotch, French, and Italian. The biography (if the term may be so applied) of each tree and shrub is drawn from varied and authentic sources in different languages, and rendered more interesting than in any work which has hitherto appeared. The only alteration we could suggest in a second edition, would be the grouping of the species together, according to their natural orders, and a general alphabetical index of all the names, scientific as well as synonymous. Many, however, will prefer the book as it is; and we can strongly recommend it as full of instructive and agreeable reading. It may be considered a suitable companion for the *Sylvan Sketches* of Mr. Strutt, a work equally delightful in its kind.

Burrow, The Rev. *E. J.*, M.A. F.R.S. L.S. Mem. Geol. Soc.: Elements of Conchology, according to the Linnean System. London. 8vo, 3d edit. 28 pls. from nature. 16*s*. plain; 1*l*. 11*s*. 6*d*. coloured.

Bainbridge, George C.: The Fly-fisher's Guide, illustrated by coloured plates, representing upwards of forty of the most useful flies, accurately copied from nature. Liverpool. 2d edit. 16*s*. extra boards.

Hendrick, The Rev. *James*, Author of the Survey of Angus-shire, and other Agricultural Works, and of various Papers in the Farmer's Magazine; an original thinker, and strong-minded man: A Lecture on Geology, delivered before the Forfar Scientific Institution, Dec. 3d, 1827, in which it is endeavoured to show that the Mosaic account of the Creation is perfectly consistent with the best ascertained facts concerning the mineral structure of the globe. Montrose. 8vo. 2*s*. boards.

Lempriere, William, M.D., Author of a Tour to Morocco, Observations on the Diseases of Jamaica, &c., and one of the Vice-Presidents of the Isle of Wight Philosophical Society: Popular Lectures on the Study of Natural History and the Sciences, Vegetable Physiology, Zoology, the Animal and Vegetable Poisons, and on the Human Faculties, Mental and Corporeal, as delivered before the Isle of Wight Philosophical Society. London. 8vo, pp. 304. *7s. 6d.*

Few means will be found more effectual, for the general diffusion of a knowledge of natural history, than the establishment of provincial museums, libraries, and botanic gardens; and the delivery of lectures and demonstrations in them. Viewing the subject in this light, it will readily be imagined that we are highly gratified with the present volume, which contains six lectures, read also to the Philosophical Society of Portsmouth (for an account of this and other natural history societies in Hampshire, see p. 190.), in complimentary return for a discourse on light and vision, read by one of the most distinguished members of that society, before the Institution of the Isle of Wight. The lectures are six; one on vegetable physiology, which embraces a very extensive view of the subject, with a recapitulation in a tabular form; one on zoology, as it appears to us, exceedingly well drawn up, and concluding with tabular views of the classifications of animals, by Cuvier and Blumenbach. There are two lectures on animal and vegetable poisons; and one on the human faculties, mental and corporeal. In his preface the author has the following remark: — "With respect to the utility of scientific associations, which are now extending themselves throughout the kingdom, we may be permitted to remark, that, as it has been deemed of importance to bestow the light of science on the labouring classes, it surely is still more essential that the middling ranks (upon whom the welfare of society so mainly depends) should also partake of its beneficial influence; and we are not aware of any pursuit more calculated to enlarge their minds, and to lay the foundation for useful knowledge, than the contemplation of that subject which the societies above alluded to have principally in view; namely, the works of the creation, the laws by which they are regulated, and the practical applications of which they are susceptible."

France.

Kittell, Dr. *B. M.:* Mémoires d'Histoire Naturelle. Paris. 8vo, 9 sheets.

Lesson, R. P., Author of the Zoology of the Voyage round the World, by the Corvet La Coquille, &c.: Complément des Œuvres de Buffon, ou Histoire Naturelle, générale et particulière, de tous les Animaux rares et précieuse, découverts par les Naturalistes et les Voyageurs depuis la mort de Buffon. 8vo, 10 vols. atlas, of 120 pls. *3 frs. 50c.* each vol.

Dupont, M. ainé, Naturalist: Traité de Taxidermie, ou l'Art de conserver et d'empailler les Animaux. Paris. 8vo. pp, 114,4 pls. *3 frs. 50c.*

Lebreux, F.L.: Histoire Naturelle des Lépidoptères, ou Papillons. Valenciennes. 12mo. *3 frs. 50c.*

Hann, W. de, Doctor of Philosophy, &c.: Recherches sur l'Anatomie et les Métamorphoses de différentes espèces d'Insectes. A posthumous work of P. Lyonet.

Lecoy, M.: Recherches sur la reproduction des Végétaux. Clermont. 4to, pp. 30. 1 pl. lith.

Cassini, M. *Henri:* Opuscules Phytologiques. Paris. 8vo, 2 vols. 12 pls. 15 *frs.*

Anon.: Examen de deux Mémoires de Physiologie Végétale, suivi de l'examen d'un passage d'un troisième Mémoire publié à Genève, comme les deux autres, sous de titre de Monographiæ Generis Polygoni Prodromus. Paris. 8vo, pp. 32.

Cuvier, M. le Baron: Discours sur les Révolutions de la Surface du Globe, et sur les Changemens qu'elles ont produits dans le Règne Animal. Paris. 8vo, pp. 400, 6 pls. 7 *frs.* 50*c.*

Fée, A. L. A.: Notice sur les Productions Naturelles de l'Isle de Java. 8vo, pp. 20.

Desvaux, A. N.: Flore de l'Anjou, d'après l'ordre des familles naturelles; avec des Observations botanique et critiques. Angers. 8vo, pp. 369. 6 *frs.*

Germany.

Betcke, Ern. Frid.: Animadversiones Botanicæ in Valerianellas. Rostock.

Steiner's Gebirgshœhen des Salzkammerguthes. Elevation of the saliferous Mountains of the Upper Ems in Austria. Salzbourg. 8vo.

Hinsinger, W.: Mineralogische Beschreibung, &c. Mineralogical Description of Sweden, reviewed from the MS. by Woehler. Leipsic. 8vo.

Bischof, G.: Chemische Untersuchungen, &c. Chemical Researches on the Mineral Waters of Geilnau, Fachingen, and Seltzers, followed by general observations on the sources of volcanic minerals, particularly on their origin, their composition, and their connection with formations. Bonn. 8vo, pp. 412.

Kaiser, Dr. *J. A.*: Die Mineralquellen zu St. Moritz, Schuls, &c. The Mineral Springs of St. Maurice, Schuls, Tarasp, Fidéris, St. Bernhardin, Perden, Vals, and Belvédère, analysed by G. Capeller, and described with respect to their historical, topographical, and therapeutical relations. Coire. Small 8vo, pp. 92.

Brandes, R., and *Kruger, F.*: Pyrmonts Mineralquellen. The Mineral Springs of Pyrmont. Pyrmont. 8vo.

Fries, Fr.: Von den Ursachen der Erdbeben, &c. Causes of Earthquakes and Magnetical Phenomena. In Two Memoirs. Leipsic. 1 lith. pl.

Boon Mesch, A. H. vander: Disputatio Geologica de incendiis montium igni ardentium Insulæ Jarvæ, eorumque lapidibus. Leyden. 8vo, pp. 126. 3 pl.

Wiegmann, Dr. *A. F. A*: Observationes Zoologicæ criticæ in Aristotelis Historiam Animalium. Leipsic. 4to, pp. 39. 12 *grs.*

Meyer, Ernest H. F.: De Houttuynia atque Saurureis. Ratisbonne. 8vo, pp. 62, tab. ænea.

Glokker, Fr.: Versuch einer Characteristic der schlesisch-mineralogischen Literatur, &c. Systematic Table for the mineralogical literary of Silesia, to the end of the eighteenth century. Breslau. 4to.

Blume, Car. Lud. and *Fascic. D. M.*: Enumeratio Plantarum Javæ et Insularum adjacentium minus cognitarum vel novarum ex herbariis Reinwardtii, Kuhlii, Hasseltii, et Blumii. Leyden. 8vo, pp. 98.

Flore, ou Gazette Botanique, 9e année. Ratisbonne. 1826.

ITALY.

Tenore, Michel, Professor of Botany in the University of Naples, Director of the Botanic Garden there, and Author of Flòra Napolitàna, and other Works:

1. Saggio sulla Geografia Fisica e Bottanica del Regno di Napoli, con Cartæ. Botanical and Physical Geography of the Kingdom of Naples, with Maps. Naples. 8vo.

The grand system of the mountainous regions of Naples is described and delineated, and the animal and vegetable productions enumerated.

2. Osservazione sulla Flòra Virgiliàna. Observations on the Plants mentioned in the Rural and Pastoral Poems of Virgil. Naples. 8vo.

M. Tenore has in this work classed and named the different plants mentioned by the poet; and, from his acquaintance with the local Flora, has made some corrections of the opinions of Professor Martin and Dr. Sprengel, both of whom had before made a similar attempt.

Chiaje, Stephano delle: Memorie sulla Storia e Notomia degli Animali senza vertebre, &c. Memoirs on the History and Anatomy of the non-vertebrated Animals of the Kingdom of Naples. Naples. 4to, pp. 184, 10 pl. gr.

Savi, Dr.: Ornithologia Toscana, ossia Descrizione e Storia degli uccelli che trovansi nella Toscana. Pisa. pp. 302.

HOLLAND.

Engelspack-Larivière, A.: Essai géognostique sur les Environs de St. Petersbourg. Brussels. 8vo, pp. 44. 2 *fr.*

SWEDEN.

Aaarsberaettelser om Vetenskapernas framsteg. Annual Report on the Progress of the Sciences, published from the Papers of the Royal Swedish Academy of Sciences, 1825 and 1826. Stockholm. 8vo, pp. 552.

Hinsinger, W.: Anteckningar i Physic och Geognosie under Resor uti Suerige och Norrige. Physical and Geognostical Notes taken during a Voyage in Sweden and Norway. Upsal. 8vo.

Aaarsberættelse om nyare Zoologiske arbreten och upptæckter. Annual Report on the recent Zoological Travels and Discoveries; arranged for the Royal Academy of Sciences. Stockholm. 8vo, pp. 113.

NORTH AMERICA.

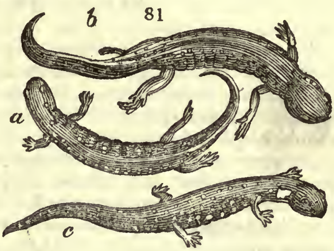
Emmons, Dr. *L.:* Manual of Mineralogy and Geology, designed for the instruction of youth, and for Travellers. New York. 12mo, pp. 230

Comstock, Dr.: Elements of Mineralogy, for Seminaries and Students. New York. 8vo, pp. 338.

Mitchill, M. *Samuel:* Catalogue des Fossiles et autres Objets géologiques et Minéralogique, contenus dans la Collection donnée au Lycée d'Hist. Nat. de New-York, par M. Samuel Mitchill. New York. 8vo, pp. 40.

Contributions of the Maclurian Lyceum to the Arts and Sciences. Philadelphia, 1827. In 8vo Numbers, occasionally. No. I. for January, and No. II. for July, 1827, have appeared.

In the introduction it is stated, that this Lyceum was established in 1826, and in commemoration of the invaluable aid afforded by William Maclure, Esq., named after him entirely without his knowledge. It is designed to comprise all the natural and physical sciences, to include a library, museum, and philosophical apparatus, and for the purpose of disseminating knowledge, and to establish a mutual intercourse with scientific societies and individuals, to publish contributions such as those before us.



No. I. contains an account of some new salamanders, by Professor Green, of Jefferson College, viz.: *S*alamándra porphyrítica (*porphyra*, purple; colour of the body) (*fig.* 81. *a*) Jefferson*iàna* (*b*), intermíxta, glutinòsa var. (*c*), and subviolàcea.

A Catalogue of the Birds of the United States, by Charles L. Bonaparte, arranged in 28 families, 81 genera, and 362 species (209 land, and 153 water birds). Of these 81 genera, 63 are common to Europe and America, while 18 have no representatives in Europe. Arranging all the known birds in 37 natural families, 28 of these families are found in America; and of these 28, two are not found in Europe.

No. II. contains some critical and other papers not of general interest.

Art. III. *Literary Notices.*

Ellis's Work on Corals, with Additions. — The science of geology is now generally acknowledged to be so dependent upon a right knowledge of the fossils which are to be found in the various strata composing the surface of the earth, that no one can be said to be well acquainted with it who has not some insight into their nature and habits. That branch of natural history which treats of shells has been most admirably illustrated by the Sowerbys; but another branch exists, in which, much to the discredit of the scientific part of the nation, very little has been done: I allude to the corals that are to be found in a mineralized state. It appears that no work, treating expressly upon this important subject, is now extant in the English language but that of Ellis and Solander, which is only to be found in private libraries. But I perceive, by reference to Conybeare's *Outlines of Geology*, p. 213., that a Frenchman, *Lamouroux*, is stated to have *re*published Ellis's work, with additions. Now, Mr. Editor, it would be very desirable, for the advancement of this branch of natural history, that this work should be known as extensively as possible; and this object cannot be better attained than by your taking notice of it in the forthcoming Number of the Magazine of Natural History.

If there be any other works which treat on this important subject, either in the French or English language, you would be doing a great service to your country readers by giving some account of them. — *William Battersly. Cannington, near Bridgewater, May* 29. 1828.

PART III.

COLLECTANEA.

Art. I. *The General Subject.*

Technicalities of Science. — It is time that we should get rid of that puerility, which would persuade us that a fact, described in terms and language familiar only to the learned, becomes of less importance when displayed in the energetical simplicity of our mother-tongue. It is time that such puerility should be placed upon the shelf, or hurried to the tomb of all the Capulets. If, however for the sake of foreigners, such a course should at any time be deemed expedient, it is hoped, that in this journal, at any rate, an English translation will accompany the Latin description, so that it may escape the complaints frequently made, and with much truth, against many of the works on natural history, which have been published in this country and elsewhere, and which appear as if designed rather to display the learning of the writers, than to state the facts which such learning ought to convey. Such, however, it is admitted, is the effect of habit, or the pride of science, or both combined, that it is very often difficult for those accustomed to scientific language and terms, to condescend to the use of such as shall make what they write at once agreeable to, and understood by, the general reader. Through inattention to these circumstances, the study of natural history has not obtained that attention in this country to which it is entitled and deserves; and I may venture to predict, that while the pride of science shall refuse to condescend to familiar explanation, the number of students in natural history will not very materially increase. However, it is to be hoped that the prospects of natural history are extending, and that the establishment of the Zoological Society in particular will excite the public attention; that the study of nature will be more simplified, and be made more attractive and more amusing. The publication of the Magazine of Natural History will, it is also hoped, be instrumental in this work, by reducing the science to the level of ordinary capacities, and by smoothing the road to more recondite views. — *James Jennings. London, June* 6. 1828.

Art. II. *Zoology.*

White Cats with blue eyes always deaf. — Sir, The brief notice at p. 66. of your interesting Magazine of Natural History, that "white cats with blue eyes are always deaf," induces me to forward to you the following confirmation of that extraordinary fact, which has come within my own knowledge. Some years ago a white cat of the Persian kind (probably not a thoroughbred one), procured from Lord Dudley's at Hindley, was kept in my family as a favourite. The animal was a female, quite white, and perfectly deaf. She produced, at various times, many litters of kittens, of which, generally, some were quite white, others more or less mottled, tabby, &c. But the extraordinary circumstance is, that of the offspring produced at one and the same birth, such as, like the mother, were entirely white, were, like her, invariably deaf; while those that had the least speck of colour on their fur, as invariably possessed the usual faculty of hearing. — *W. T. Bree. Allesley Rectory, near Coventry, May* 23. 1828.

Owls feed their young with Fish. — Probably it may not be generally known to naturalists, that the common brown owl (*S*tríx strídula) is in the habit, occasionally at least, of feeding its young with live fish; a fact which I have ascertained beyond doubt. Some years since several young owls were taken from the nest, and placed in a yew tree in the rectory garden here; in this situation the parent birds repeatedly brought them live fish, bull-heads (Cóttus *G*òbio) and loch (or loach, Cobìtes barbátula), which had doubtless been procured from the neighbouring brook, in which these species abound. Since the above period, I have, on more than one occasion, found the same fish, either whole or in fragments, lying under the trees on which I have observed the young owls to perch after they have left the nest, and where the old birds were accustomed to feed them. It has always been a wonder to me by what method the owl contrives to capture the finny tribes, being apparently a bird peculiarly unfitted for piscatory depredations. If you, or any of your correspondents, better acquainted than myself with the manners and habits of the bird, should be able to solve the difficulty, I should be obliged by their so doing. — *Id.*

Owls feed on Fish. — This circumstance is mentioned in *Jennings's Ornithològia*, and corroborates a declaration made by a labourer who was employed to watch the fish-pond in the flower-garden of Bulstrode, about 50 years ago. The gold and silver fish had been missed; the duchess (Margaret, grandmother of the present Duke of Portland) being a lady of distinguished taste for every curious object of natural history, suspecting that the pond had been poached, ordered Mr. Agnew, the gardener, to employ men to watch. The watchmen detected the robbers, whom they saw alight on the side of the pond, and there waiting the approach of the fish, captured and devoured them! The common brown owls were the robbers, at least so the men reported; but they were not generally credited. One of the men, Joseph Newman, who reported the above circumstances, still attests the fact. — *J. M.*

The Golden-crested Wren may be taken, by striking the bough upon which it is sitting, sharply, with a stone or stick. The timid bird immediately drops to the ground, and generally dead. As their skins are tender, those who want them for stuffing will find this preferable to using the gun. White remarks, in his *Natural History of Selborne*, "that the golden-crested wren (the smallest British bird) will stand unconcerned till you come within three or four yards of it." — *D. S. Bungay, March*, 1828.

Art. III. *Botany.*

Influence of Light on colouring the Leaves of Plants. — It frequently happens in America that clouds and rain obscure the atmosphere for several days together, and that, during this time, buds of entire forests expand themselves into leaves. These leaves assume a pallid hue till the sun appears, when, within the short period of six hours of a clear sky and bright sunshine, their colour is changed to a beautiful green. A writer in Silliman's *Journal* mentions a forest on which the sun had not shone during twenty days. The leaves, during this period, had expanded to their full size, but were almost white. One forenoon the sun began to shine in full brightness. "The colour of the forest absolutely changed so fast that we could perceive its progress. By the middle of the afternoon the whole of these extensive forests, many miles in length, presented their usual summer dress." (*Silliman's Jour.*, xiii. p. 193.)

Art. IV. *Geology.*

To observe the Formation of Soils upon a small Scale. — Sir Humphrey Davy has explained, in his *Agricultural Chemistry,* how this takes place on the surface of naked rocks by partial decomposition; the growth of lichens being succeeded by mosses, and, on their decay by the smaller plants. A writer in the *Verulam* observes, " even in cities this may be done by observing the successive steps by which the top of a brick wall, for example, becomes covered with vegetation. First, there is the green incrustation, called Býssus by Linnæus, but recently proved by our friend, Mr. Drummond, of the Cork botanic garden, to be the primary germination of several species of mosses, such as *P*olýtricha and Tórtulæ. When this decays, a very thin stratum of vegetable earth is formed, which affords a scanty support for the roots of the next year's crop of mosses, and in process of time soil is formed of a sufficient depth for Dràba vérna and other wall plants."

Art. V. *Meteorology.*

East Winds and Blights, April 30. 1828. — In conversation with Mr. Gibbs of Brompton, he stated, that " we would certainly have an *east wind* about this time." The wind had veered to the east in the morning of this day, but at the time we were speaking it had changed to the north-east. He added, however, that for twenty-two years he had paid particular attention to this circumstance; and, except twice, always observed that the wind blew from the eastward at the beginning of May.

No one who has paid attention to the progress of vegetation in the vernal months, but can remember how often they have had to witness the withering effects of the east wind on the tender plants, flowers, and shoots of this season: its parching effects on the garden, and its hurtful consequences to the young barley in the fields, are frequent complaints. These easterly winds, too, are frequently attended by a blue mist, called, by those living to the westward of the metropolis, " London smoke;" and though it is well known, that the fuliginous vapour of this great city extends, like the train of a comet, to the distance of fifty miles, yet that blue mist or haze, which is known to be so extensive, cannot be occasioned by such a local circumstance. But from the want of simultaneous meteorological observations at numerous distant stations, (a want which your Magazine is well designed to remove), we have not sufficient data on which to form a rational opinion, as to the prevalence of either the east wind or the blue mist. The latter is called a blight, and many people imagine that the aphides are wafted through the air by this same mist; because the depredations of these insects become visible at the time, or soon afterwards: but with such winds we have commonly a clear sky; in course the sun's heat is intense, and this it is which brings forth the insects from every place where they were deposited in the previous autumn, and also instigates the pregnant females to bring forth their incalculable generations.

With respect to the direction of the wind at this period, I can only offer an opinion which, I must own, rests on a very slender foundation. Having had some acquaintance with the trade-winds of intertropical latitudes, and, since my residence in England, having on many occasions been struck with similar appearances, accompanied by easterly winds, I naturally conjectured that such currents of air arose from the same cause, and that circumstances of the state of the air, and of the general face of Europe, might temporarily and occasionally produce those periodical winds observed by Mr. Gibbs. — *J. M.*

PART IV.

MISCELLANEOUS INTELLIGENCE.

Art. I. *Natural History in Foreign Countries.*

ITALY.

An Eruption of Mount Vesuvius took place on the morning of the 22d of March last, which has been well described in the *Athenæum* for April 18th. A correspondent who was at Naples at the time thus writes: "The cone of the mountain puts you in mind of an immense piece of artillery, firing red hot stones and ashes and smoke into the atmosphere; or, of a huge animal in pain, groaning, crying, and vomiting; or like an immense whale in the arctic circle, blowing after it has been struck with several harpoons." — *R. F. Naples, April* 1.

ASIA.

Cedars of Lebanon on Mount Lebanus. — We went to the cedars of Lebanon. I counted thirteen large and ancient cedars, besides the numerous small ones, which make, in the whole, 387 trees. (*Wolff's Missionary Journal*, 1823 and 1824) — The largest of these trees was 8½ cubits high, which, taking the cubit, or fore-arm, at 1 ft. 9 in., will give a tree of about 15 ft., not one-third of the height of hundreds of English cedars; for instance, those at Whitton, Pains Hill, and Caenwood. — *Cond.*

Art. II. *Natural History in London.*

The British Museum. — Since the publication of Art. II., in the First Number of your Magazine, which contained observations on the collections of natural history in the British Museum, I was informed that considerable improvements had recently been made in some of the departments. I have, therefore, been induced to revisit the different rooms accessible to the public, and I think it but justice to state the results of my examination.

Every Englishman with correct and honourable feelings, must wish to see the scientific institutions of his own country rival, if not excel, those of other nations. He will hail the successful labours of men of science in every department; and, without stopping to enquire whether they belong to his own coterie, or are members of his own society, he will exclaim,

> "Je prends part à leur gloire, leur bonheur est le mien."

I can truly say, it gave me much pleasure to observe that the spirit of improvement had visited the British Museum, and that some of the arrangements which had so long been left incomplete, were at length accomplished in a satisfactory manner. On the upper landing of the grand staircase, the giraffes present a very different appearance from that which I remember when I was last at the Museum. At that period there were only two of these animals; and so little care was taken in stuffing the skins, that the legs resembled gate-posts more than the limbs of a beautiful quadruped. At present, due attention has been observed to preserve the just proportion and symmetry of the parts, and the three figures form an interesting group. I mention these objects, because their improved appearance *in limine* augured well for the improvements in other parts of the establishment. On entering the ante-room of the saloon, I was pleased to observe a large collection of fossil univalve shells, arranged in cases, which cover the centre of the room; these, however, have only been introduced very recently, to judge from the catalogue of 1827, in which they are not in any way noticed. I shall revert to this collection again. The saloon contains a beautiful collection of simple minerals, a great part of which belonged to the Greville collection. Of this collection I have only to repeat what I stated in Art. II., that "it is, perhaps, as well classed as the space allowed for it will admit of." More care, however, appears to be taken in placing labels; and several new specimens have been added, particularly of meteoric stones, and meteoric native iron. The next room, No. 8., contains the collection of recent shells, in 26 cases, well arranged, and conveniently displayed for inspection. The names of Lamarck are on one side, and those of Linnæus (which are here more generally known) on the other. The collection may be regarded rather as a useful than a splendid one, compared even with private collections in this country; among others might be particularised that of Dr. Goodall, Provost of Eton. On taking a general view of the whole, the reason did not appear very obvious why its arrangement should have required so many years to complete. It is true, that the system of Lamarck was but imperfectly understood in England, even seven or eight years since; but many naturalists might have been found on the Continent, who would, with much ease, have arranged the collection in fewer weeks, than it has taken years to accomplish; and a whole generation of young men have grown up between the years 1810 and 1823, who might have profited by it, and been now adding to the stock of natural knowledge in various parts of the world. It is, however, useless to dwell upon the past; it is more gratifying to observe, that there is now a well-arranged collection of recent shells in the British Museum, accessible to the public; and young persons who visit London, and are desirous of cultivating this branch of natural history, may have an opportunity of improvement which few, if any, of our provincial towns present.

"*Si fas est doceri,*" if it be lawful for the curators of this collection to receive a hint, not *ab hoste*, but from a true friend to the scientific institutions of his own country, he would suggest, that the collection might be made more instructive, by placing the name of each genus at full length, at the head of each compartment, where the species occupy more than one; and, where two genera begin with the same letter, as Cápsa and Crassìna, instead of simply placing C, to add the first letters, and write Cap. Cras.; because learners who are examining the shells, are frequently prevented from reverting to the generic words, by the company crowding round the cases. As conchology forms the amusement or the study of many ladies who neither read Greek, nor are familiar with the works of Cuvier or Lamarck, a short explanation of the terms Gasterópoda, Cephalópoda, &c. would be useful. It would, at least, remind them, that the knowledge of the shell forms but a small part of the natural history of the Mollúsca; and that a knowledge of the structure of the animals, and of their modes of forming their shells, would be infinitely more curious and valuable could it be obtained.

Let us now return to the fossil shells in the ante-room. These are chiefly univalve shells, from the tertiary formation of the Paris basin; but there is one great defect in the arrangement of these, and of all the other fossil shells in the Museum. They are placed without any reference whatever to their geological position, and the localities of the English fossil shells is seldom given. In the cases in the ante-room, the very important distinction of the marine and fresh-water shells is not made, nor is any information afforded whether the shells belong to the series of strata below the gypsum, or the series above. Thus, those persons who are not already acquainted with the fossil conchology of the different formations, will derive much less instruction from this collection, than they might do were the shells geologically arranged. Indeed, fossil conchology, without a reference to geology, is as useless, as the study of history would be, without any reference to geography and chronology. The want of geological arrangement is still more striking in the fossil collection placed in the room No. 9. The locality, or the name of the formation in which they were found, is not, I believe, given with any of the English fossil shells or zoophytes. On this account, the fossil conchology in the British Museum may be said to remain in a very defective state.

Round the room No. 9., there are, however, numerous interesting specimens of vertebrated animals of the saurian or lizard family, and also of fossil fish; the localities of the foreign specimens are annexed. There is also an interesting collection of fossil bones of the larger mammalia, and of the carnivorous animals found in caverns, and some fossil remains of birds; these are all as well placed and arranged, as the form of the cases will admit of.

The large room No. 10., is occupied with what is called, in the catalogue, "the rudiments of a collection of British simple mineral substances;" but many of the cases, after a lapse of several years since the collection was began, are still empty, or nearly so. It is to be regretted that a large space is so injudiciously appropriated, in an establishment where room is much wanted. The minerals of each county are in separate cases, but there can be little utility in having specimens of common galena, calamine, &c. from all the counties in which they occur*; to enumerate their localities in a catalogue would surely be sufficient. The waste of room is the more to be lamented, as there is at present no geological collection of rock specimens in the Museum, either illustrative of general geology, or the geology of our own country. A foreigner visiting the British Museum, might suppose that the science, and even the very name of geology, were unknown in England. In this respect, the former mineral collection was preferable to the present, as it contained illustrative specimens of the primary and transition rocks. There is ample space in the room No. 10., for specimens of each known species of simple minerals in England, and for the principal varieties; and also for a well-arranged collection of geological specimens, comprising the strata in all the formations in Great Britain. It would be difficult to offer a satisfactory reason why such a collection is not placed there.

The zoological collections in the British Museum may be briefly dismissed. The whole collection of insects is contained in four small cases; nor are these completely filled. The birds, and mammiferous quadrupeds, are arranged according to the orders of Linnæus, but want of room prevents their being placed in situations sufficiently accessible for inspection. The species of quadrupeds are not numerous, owing, I believe, to the decay which too speedily takes place in stuffed specimens, particularly in the atmosphere of London. From the liability to decay, the difficulty with which they are replaced, and the great space they occupy, stuffed specimens of quadrupeds might, perhaps, be conveniently dismissed from our collections,

* The counties being artificial divisions, the minerals in adjacent counties are generally identical, or at least as much so as the same minerals from different parts of the same county.

except of such rare animals as can seldom, if ever, be brought alive to Europe. Skeletons, exhibiting the structure and distinctive characters of the orders and genera, accompanied with correct coloured drawings of the species, arranged in frames, would be far more durable, and convey more scientific information than stuffed specimens; they would occupy less space, and also be less expensive.

A slight inspection of the rooms in the Museum, appropriated to natural history, will prove that the science has outgrown the space allotted for it.

It is much to be desired that ample room may be found in the buildings now erecting, to exhibit properly the objects in every department of nature, and that our national museum may be placed on a par with the museums of natural history on the Continent. We may also be permitted to express a wish, that no unnecessary delay in completing the arrangements may be tolerated. It would add greatly to the utility of the collections, if, beside the general catalogue at present published, an ample systematic catalogue were also to be published, for the use of those who are commencing the regular study of natural history.

Linnean Society. — *May* 4. The reading of Mr. Morgan's paper, on the mammary organs of the kangaroo, containing farther particulars of the dissection of these parts, as well as of the muscles attached to the marsupial bones, in the adult and impregnated animal, was continued. These bones, with their ligamentous and muscular connections, were described, and several errors in Sir Everard Home's published account of these parts were pointed out. The author then stated his own opinions respecting the use of these structures. He stated that the marsupial bones are formed, first, for the purpose of giving that firm support to the superincumbent abdominal viscera which the narrow pelvis of the animal is incapable of affording, while in the erect posture; and, secondly, for the purpose of constituting a fixed point of resistance, against which the mammæ are squeezed by the muscular girdle already described as enclosing those glands between their fibres. By this arrangement, the female is enabled to empty, by compression, the excretory ducts of its mammæ, and thus to force their secretions into the mouth of the imperfectly organised young, which, during the earlier periods of its existence, appears incapable of extracting a nutritious fluid from that part, by the usual means.

It appears that the secretion of this fluid (or milk) takes place only in the larger and lower gland, and that its ejection through the inferior and longer teat is assisted by a muscular investment, which incloses the ducts throughout their whole course, from the gland to the extremity of the nipple. The existence of this structure has been noticed by M. Geoffroy St. Hilaire, who has assigned to it the same use. Under this compressing muscle of the lower, or, as Mr. Morgan has named it, the true, marsupial teat, a congeries of vessels, which principally consisted of veins, was described as forming a plexus around the central fasciculus of ducts. These veins, together with those of the gland, were stated to occasion a considerable distension of the mammary organ during the time of suckling, in consequence of the congestion which must necessarily occur in the vessels at that period, from the pressure made upon their main trunks by the action of the compressing muscle of the mammæ; for it has been found, that the size of the organ, on such occasions, exceeds that which a loaded state of the ducts only could produce. The mammæ were found, as in the virgin animal, to consist in double glands on each side, the upper and smaller presenting the same anatomical characters as in the former instance; its excretory ducts, however, in their course towards the upper nipple, were found to be enclosed in an indistinct muscular sheath, and there was a faint indication of the existence of a plexus of vessels similar to that which was found in the lower or true marsupial teat. This smaller mammary organ is considered by the author as analogous to the supernumerary mammæ and teats of other mammiferous animals, since the lower, or true, marsupial mammary glands and their teats, appear to perform, exclusively, the office of preparing a nutritious fluid for the support of the young animal. (*Phil. Mag. and Annals of Philosophy*, June.)

May 24. The anniversary meeting took place, at which Edward, Lord Stanley, was elected President, in the room of the late Sir J. E. Smith; and Edward Forster, J.E. Bicheno, and R. Taylor, Esqrs., respectively reelected to the offices of Treasurer, Secretary, and Under-secretary.

June 3. Read. A description of a new genus of quadrupeds named Lagóstomos (*lagōs*, a hare, *stoma*, a mouth; the head of the animal resembling that of a hare) trichodáctylus (*thrix*, hair, *daktylos*, a toe), belonging to the order of Rongeurs *Cuv.*, Glìres *Lin.*; by Joshua Brookes, Esq. F.R.S. L.S.

June 10. The Council having had an offer of the late respected president's collections in natural history, consisting of the collections and library of Linnæus and his son, and the president's own collections and library, submitted to the consideration of the Society, a proposal for purchasing the same for the use of the Society, for the sum of 4000*l.*; and a subscription was immediately opened for that purpose, the amount of which, up to the period at which we write, is nearly 1000*l.* The subscription may either be in one principal sum, or so much per annum. Lord Stanley, the president, put down his name for 21*l.*, and 2*l.* 2*s.* annually; and Mr. Anderson, of the Chelsea botanic garden, and some other gardeners and nurserymen, greatly to their honour, for 2*l.* 2*s.* annually. We have no doubt this treasure will be obtained for the Society, and it is highly fitting that it should.

Geological Society. — *April* 18. A paper was read, "On the fossil remains of two new species of Mástodon, and of other vertebrated animals, found on the left bank of the Irawadi; by William Clift, Esq. F.G.S. F.R.S., conservator of the museum of the Royal College of Surgeons."

The author having been requested to describe the fossil remains which the zeal and liberality of Mr. Crawfurd have transferred from the deserts of the Irawadi to the museum of the Geological Society, confines himself strictly to zoological and anatomical details; and, following the system of Cuvier, commences with the

Pachydérmata proboscidífera. The only genus of this order indicated by the remains is the Mástodon, and of this there are two species, Mástodon látidens and Mástodon elephantöìdes, not only commanding attention from their novelty, but from the beautiful gradation which they exhibit between the mastodons already described and the elephant. On comparing the teeth of Mástodon látidens with those of the mastodon of the Ohio (M. giganteum), the denticules are found to be more numerous and less distant, and the interstices less deep than in those of the latter; the teeth, in short, begin to assume the appearance of those of the elephant. On advancing to Mástodon elephantöìdes, these features of similarity are more strongly developed; the many-pointed denticules are still more numerous and more compressed, and the structure, were it not for the absence of crusta petrosa, becomes almost that of the tooth of the elephant. In both, though the teeth are formed upon the principle by which the tooth of the mastodon is distinguished from that of the elephant, the crown of the tooth wears away more like that of the elephant than that of the other mastodons.

Pachydérmata ordinària. In this group we have the remains of the genera sus, hippopotamus, and rhinoceros. Of the first there is only a single specimen, consisting of a small portion of the lower jaw, containing one molar tooth, and the fragment of another; of the second there are but few fragments, nor are they sufficiently characteristic to warrant a definition of the species, which must have been comparatively small; of the third there is a portion of the upper jaw, containing two molar teeth, and portions of the lower jaw with molares, which seem to approach nearer to those of the Rhinoceros of Java than to those of any other living species.

Ruminántia. In this group we have fragments of the ox and of the deer.

Reptília, Chelònia *Cuv.* (Testudinàta *Bell.*) There are many fragments of a large species of trionyx, and some of an emys; but the remains are not sufficiently defined for specific description.

Saúria, fam. Crocodilìdæ. Of this family we have the remains of two genera, viz. a Leptorhýnchus, allied to, if not identical with, the great gavial, and a crocodile resembling Crocodìlus vulgàris. Of the former there are portions of the lower jaw and several vertebræ; of the latter there is the anterior termination of the lower jaw, which must have belonged to a very large individual.

The specimens, in general, do not appear to have undergone any mineral change, with the exception of being abundantly penetrated with iron, and are very brittle. This last circumstance, arising from the loss of their animal gluten, indicates great antiquity, and that they have not been imbedded in any very compact soil; unlike the teeth of the mastodon of the Ohio, which lie in a strong blue clay, and have almost as much animal matter as is to be found in a recent tooth.

The bones are almost in every instance broken, and, from the firmness of texture of most of them, the direction and cleanness of the fracture, and the sharpness of its edges, the injury, which must have been the result of an immense power operating with sudden violence, appears to have taken place at the period, or very soon after the period, of the destruction of the animal.

A paper was next read, "On a collection of vegetable and animal remains, and rocks, from the Burmese country, presented to the Geological Society by J. Crawfurd, Esq.," by the Rev. W. Buckland, D.D. V.P.G.S. F.R.S. &c.

Mr. Crawfurd collected these specimens during his voyage up the Irawadi, in a steam-boat, on an embassy to Ava, in the latter part of the year 1826. The author considers them to be of high importance, as affording an answer to the curious and till now undecided question, whether there be, or be not, in the southern regions of Asia, any remains of fossil quadrupeds analogous to those which are found so widely dispersed in the diluvium of northern Asia, and of Europe and America.

The evidence which Mr. Crawfurd has imported consists of several chests full of fossil wood and fossil bones, and of specimens of the strata that are found along the course of the Irawadi, from Prome up to Ava; being a distance of nearly 500 miles. The greater part of the fossil wood is beautifully silicified; other specimens of it are calcareous: they are mostly portions of large trees, both monocotyledonous and dicotyledonous, and were found along the whole valley of the Irawadi from Ava to Prome. The bones were all collected from a small district near some wells of petroleum, about half way between these towns, and on the left bank of the river. From Mr. Clift's examination, it appears that although we have among them no remains of fossil elephants, we have the same fossil Pachydérmata that are found associated with elephants in Europe, namely, rhinoceros, hippopotamus, mastodon, and hog. We have also two or three species of ruminantia resembling the ox, antelope, and deer, with the addition of the gavial and alligator, and two fresh-water tortoises, namely, trionyx and emys.

The teeth of the mastodon belong to two unknown species of that genus, both of them approaching in size to the largest elephant. Mr. Clift has designated them by the names of Mástodon látidens and M. elephantòides. The teeth are from animals of all ages; and there are many fragments of ivory, derived probably also from the mastodon.

The remains of the mastodon are by far the most abundant in this collection, and amount to about 150 fragments.

Of the rhinoceros there are about 10 fragments; of a small species of hippopotamus, 2; of the hog, 1; of the ox, deer, and antelope about

20; of the gavial and alligator, about 50; of the emys, 20; and of the trionyx, 10.

One fragment of emys is so large, that the animal of which it formed a part must have been several feet in width.

The state of preservation of these bones is very perfect, from their being penetrated with hydrate of iron, and thereby rendered strong. Not one of them is silicified, though they have been erroneously stated to be so, in some of the periodical journals.

The district in which they were found is a little north of the town of Wetmasut, and is composed of barren sand-hills and beds of gravel, intersected by ravines, and cemented occasionally into a breccia by carbonate of lime, and sometimes by hydrate of iron. Over the surface of these hills were scattered the fragments of bones and wood, some quite naked and loose, others half buried in the sand and gravel. Many fragments of wood lay also at the bottom of the ravines. About one third of the bones have been slightly rolled, and the rest had all been broken before they were lodged in the places where Mr. Crawfurd found them, and where they appear to have been dispersed and buried by the action of the same waters that produced the diluvial sand and gravel; whence they have since been washed out, and left bare by the action of rains and torrents.

Concretions of sand and gravel adhere to many of the bones, but they contain no traces of shells, and differ mineralogically from all the rock specimens in this collection, which we recognize as belonging to tertiary and fresh-water strata.

Indications of fresh-water formation were found in one spot only, not far from the fossil bones, and they consist of a marly blue clay, abounding with shells of a large and thick species of Cyrĕna.

The tertiary rocks are, 1st. a dark slaty limestone, containing many shells, that have been identified by Mr. Sowerby with those of the London clay; 2d. a yellow sandy limestone, containing shells, and resembling the calcaire grossier; and 3d. a soft greenish sandstone, resembling the sandy beds of our plastic clay formation.

This London clay and calcaire grossier afford an additional locality of these strata to those indicated by the specimens described by Mr. Colebrooke, in vol. i. part i. second series of the *Geological Transactions*, which had already established the existence of this formation in the north-east border of Bengal.

Mr. Crawfurd states distinctly, that it is impossible to refer the situation of the bones, or the origin of the hills containing them, to any operations of the existing river. These hills are 60 ft. above the level of its highest flood. The effect of its actual operations, he observes also, is distinctly visible in the shifting islands of mud and sand that abound along the whole course of the river within this high-flood level, and in the great alluvial delta that extends from a little below Prome to Rangoon and the Gulf of Martaban.

The recent bones and recent wood which he observed to be stranded on some of these islands, were not in a state of progress towards becoming mineralised, but were falling rapidly to decay.

The existence of so many animal remains analogous to those that occur in the diluvium of Europe, in a matrix which so nearly resembles that dilivium, and which so decidedly differs from the alluvium, and fresh-water, and tertiary strata of the adjacent country, seems to authorise us to refer this matrix to a similar diluvial deposit in the valley of the Irawadi, reposing irregularly upon the tertiary and other stratified rocks, that form the basis of that district.

Besides the tertiary strata above enumerated, there are specimens of grauwacke and transition limestone, from several distant points in the valley of the Irawadi between Prome and Ava, which render it probable that the fundamental rocks of this valley belong to the transition series.

On the north of Ava there are chains of primitive mountains abounding with statuary marble, associated, as usual, with horn-blende and mica slate.

We may, therefore, consider it as now established, on the authority of Mr. Crawfurd's notes and specimens, that the Burmese country not only contains the remains of fossil animals above enumerated, but also affords examples of the following geological formations, which can be identified with those of Europe, namely, 1. Allùvium; 2. Dilùvium; 3. Fresh-water marl; 4. London clay and calcaire grossier; 5. Plastic clay, with its sands and gravel; 6. Transition limestone and grauwacke; 7. Primitive marble and mica slate.

May 2. Lieutenant William Glennie's paper, on the "Ascent of Popocatapetl," was read, an abstract of which we shall give elsewhere.

Zoological Society.—April 29. The anniversary meeting of the members of this society was held at the rooms of the Horticultural Society, the Marquess of Lansdowne, President, in the chair. The meeting was numerously attended. The President congratulated the meeting on the continued progress which the society had made during the past year, as well in the great accession to their numbers, as in the development of their objects and the extension and improvement of their plans. He also suggested another topic of congratulation — the state of the finances. The secretary then read a report, by which it appeared the receipts during the last year exceeded 5,000*l.*, and that a balance of nearly 1,000*l.* remained in the banker's hands on the 1st of January. Since that period, upwards of one hundred and thirty additional members have joined the society, and the secretary announced that several names were added on the morning of the meeting: among them were those of the Duke of Wellington and the Earl of Harrowby. A list of animals in the garden of the Society was then read, and a present of four kangaroos, bred in this country, was announced, from the Marquess of Hertford. Some regulations for the admission of members and visitors to the museum and gardens were then proposed, and, after some discussion, adopted. According to these regulations, members have the right of *entrée* to both establishments, at all times, with one or two friends; and the public will, in the course of the season, have admission to the museum and gardens on three days in the week, on payment of 1*s.* each person. Members can also purchase a ticket, at the rate of one pound annually, which will admit two additional persons. These regulations will be modified by the council as circumstances may require. Five new members of the council; viz. Hon. G. A. Ellis, M.P.; Thomas Hoblyn, Esq., F.R.S.; Earl of Mountcharles, M.P.; S. Taylor, Esq., F.L.S., and Sir R. Vyvyan, Bart. were proposed and elected. The Marquess of Lansdowne was reelected President; and N. A. Vigors, Esq. Secretary. (*Verulam.*)

May 14*th.* The council have thought it essential to the interests of the society, that the following regulations be adopted and strictly adhered to: —

Every member shall have personal admission to the gardens and museum, with two companions. If accompanied by more than two, he shall pay one shilling for each extra person.

A member, on payment of one guinea annually, may obtain an ivory ticket which will admit one named person with a companion to both establishments; or a transferable ivory ticket which will admit one person. He may obtain two or more such tickets at the same rate.

Any member who may find it inconvenient to attend personally at the gardens or museum, may, upon application to the council, have his privileges transferred, within the present year, to any individual of his family, whom he may name.

Every member will be expected to give his name on entering the garden and museum.

The gardens will be open to members from eight o'clock, A.M.; but they will be in complete readiness for the reception of visitors only from ten o'clock to sunset. The museum will be open from ten o'clock to six.

We cannot but regret that a liberal institution should have been obliged to resort to admission money; so many regulations, too, are bad on the face of them. If accompanied by more than two, it will not be the value of the "one shilling for each extra person" that will be the most painful, but a sense of restraint, more easily conceived than expressed, and amounting almost to a feeling of degradation. Then the purchase of "ivory tickets," by those who can afford them, at once makes two classes, and consequently ranks of those who ought to be one, and, as members of the society, on a perfect footing of equality. We should have thought the feeling produced in the Horticultural Society, by the creation of different ranks and privileges would have operated as a warning in this case. Our opinion is, that in all literary or scientific societies, it should never be in the power of wealth or hereditary rank, as such, to procure any advantage over the poorest member of such societies. But perhaps our opinion is erroneous, and we are quite willing to listen to that of others. Instead of the first five of the above regulations, we would allow every member to give as many admission tickets as he chose, and we should say, that the more he gave, the more would the objects of the society be promoted: or, if money is to be taken at the door, let it be taken from those who present themselves. — *Cond.*

Medico-Botanical Society. — *May* 9. Several books, and a variety of rare plants were presented, and two papers read. On the Haimarada of Demerara, Vandéllia diffùsa *Lin.* Scrophularíneæ (*fig.* 82.), by Dr. John Hancock of Demerara. This humble plant, which grows on the road-sides in Guiana is, by the Dutch Creoles, called "Bitter Blairr," and is announced by the author as most efficacious in several diseases of the natives, but more particularly intermittent fevers. A paper on the Bushmen of the Orange River, and their poisoned arrows, by Mr. Louis Leslie, assistant surgeon of the 48th regiment, and communicated to the Society by Sir James M'Grigor, President, was also read. The author, who was stationed on the banks of the Orange River, South Africa, before the post was abandoned, after giving a short description of the appearance of these miserable beings, who are said by him to live on locusts, ants, and some farinaceous roots, states, that he has not been able to procure one authenticated relation of death in man from the effects of the arrows employed by the Bushmen in self-defence. Mr. Frost, the director, delivered some extemporary observations in very good style on the plants, chiefly from the hot-house and green-house, furnished by our neighbour Mr. Campbell from the Bayswater botanic garden.

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Zoological Imposture. — A female bear, shaven, and dressed as a woman, is now exhibiting in a caravan in the Borough, as a monstrosity of the human species from the deserts of Arabia. The animal is placed in an armchair, and tightly but concealedly strapped to it, so as to assume the appearance of a human figure in a sitting position. The skin of the hands and feet, besides being closely shaved, is artificially coloured. — *J. R.* *May* 15.

Art. III. *Natural History in the English Counties.*

Hampshire.

The Portsmouth Philosophical Society owes its existence to the meetings of a few scientific individuals, for the purposes of experimental philosophy, in the year 1815, whose numbers being increased in 1818, they formed a Society, published a code of laws, and elected a president; and in 1821 published their first annual report. Their rooms are in Pembroke Street, where they have a theatre for the delivery of public lectures, capable of accommodating three hundred persons, and a spacious museum. This collection was commenced in 1822, but it was not till 1824 that the addition of nearly two thousand specimens, and the introduction of lectures on natural history directed the particular attention of the members to this department, from which period it has continued rapidly to increase, and now contains more than nine thousand specimens in natural history, consisting of a few quadrupeds, about two hundred birds, reptiles dried and in spirits, fishes, insects more than one thousand, a series of crustàcea, mollúsca dried and in spirits, shells about three thousand, a variety of zoóphyta, several hundred minerals and geological specimens, about one thousand five hundred fossil organic remains, amongst them a complete series of the Hordwell fossils figured by Branden. In botany a Flòra A'rctica, a Hórtus Síccus of Mont Blanc, the *F*ílices of Jamaica, a Cryptogàmia of Newfoundland, the British Cryptogàmia of the late Mr. Hay, collected during a long life, with particular attention to the subject, the rudiments of a British and General Herbàrium, &c. A considerable number of coins, and a great variety of miscellaneous objects of curiosity; the whole arranged in glass cases, well suited for preservation and display. In the same room is the Society's extensive and valuable philosophical apparatus.

In this museum the following points are particularly attended to: the preparation and preservation of every specimen in the best possible condition; the systematic classification of the subjects, so as to present every aid to the student which the smallness of the collection will admit. The acquirements of all local specimens, affording to the scientific tourist, at one view, the productions of the district. The present arrangement is mostly Linnean. Lectures on natural history form a part of the proceedings of the Society, and the following courses have been delivered since the establishment of the museum: — On the Study of Natural History; the Classification of the Animal Kingdom; Ornithology; Entomology; Conchology; the Mollúsca; the Zoóphyta; the burrowing and boring Marine Testàcea; Habits, &c. of certain Testàcea; the Vegetable Kingdom; Anatomy and Physiology of Plants; Mineralogy; Oryctology (*oryktos*, fossil, *logos*, discourse); Geology of the Island of Portsea; the Chalk Formation; Animal, Vegetable, and Mineral Poisons, &c.; besides a variety of illustrations of donations, short papers, notices, and discussions on subjects connected with natural history.

The freest admission is at all times obtainable to view the museum; the curator is always ready to give every information relative to the collection, and impart to friends going to foreign parts the best methods of collecting and preparing objects in every department. By far the greater portion of the specimens have been presented by the members and their friends, and the great interest taken by them in its prosperity, together with its local advantages, present every prospect of its becoming both creditable to the institution and respectable as a provincial collection. Accompanying this communication is a copy of the laws and regulations of the Society, and a report of its state for 1826–7.— *J. H. D. June*, 1828.

The Philosophical Institution of Newport, Isle of Wight, is an old established Society, holding stated meetings for the delivery of lectures, and having a museum, containing a small but interesting collection in natural history, antiquities, &c. From its isolated situation its progress has been comparatively slow, and from the same cause its members are but few in number, though possessing a very considerable share of talent. A course of lectures on the study of natural history, &c., by W. Lempriere, M.D. Vice-President, have been lately published. (see p. 183.) — *Id.*

The Philosophical Society of Southampton, established at the commencement of the present year (1828) on principles similar to that of Portsmouth, has commenced the formation of a museum, and acquired a considerable number of specimens, principally by way of deposit. From the emulation excited amongst the scientific individuals of that neighbourhood its speedy accumulation may be anticipated. — *Id.*

Museum of the Royal Naval Hospital, Hasler. — In the left wing of this noble edifice the commissioners of His Majesty's victualling department have lately erected two elegant rooms; the lower, superbly fitted up with mahogany cases, commodious seats, &c. as a library and lecture-room for the delivery of lectures to the medical pupils; the upper, finished in the most costly style of Grecian design, for the reception of a museum; the table, and upright cases, being of solid mahogany with brass ornaments, and the whole arrangement strikingly tasteful. It already contains many curious specimens in morbid anatomy, and a considerable number of foreign birds, insects, shells, minerals, plants, &c. principally presented by the medical officers of His Majesty's navy. From the peculiar advantages possessed by this museum, and the professional acquirements of its directors and supporters, it may be expected to become particularly rich and valuable in morbid and comparative anatomy, as well as highly interesting as a general collection. — *Id.*

We are extremely obliged by these notices, and hope other readers and friends will follow the example. We should like not only to have accounts of the museums of natural history in every town and county in the empire, but the natural history of particular estates, mountains, valleys, basins, lakes, parishes, districts, and counties. — *Cond.*

Scílla nùtans, your correspondent E. K. (p. 83.) informs us, is found with white flowers, in Combe wood; so it is in Reffy wood, near Lynn. — *The Rev. George Munford.*

So it is on the left-hand side of the road between Crickhowel and Brecon, about half a mile from the former town. — *H. J. Reed. Abergavenny.*

Large Trees. — A few days ago, an ash tree was felled in Blackburn Hollows, near Shiresgreen, Yorkshire, containing 750 feet of solid timber; it was 10 ft. 6 in. across the stool. An oak tree was also felled in Shiningcliff, near Crich, Derbyshire, containing 965 feet, and 13 ft. 4 in. across the stool. (*Morn. Chron.*, Feb. 14.)

Spanish Asses. — The Duke of Buckingham has, at his seat at Avington, a team of Spanish asses, resembling the zebra in appearance, which are extremely tractable, and take more freely to the collar than any of our native species. (*Farm. Jour.*, May 19.)

The Ladybird is remarkably abundant this season. The shrimp of this insect destroys both turnips and peas in many parts of England, and if some entomologists, such as Mr. Curtis, Mr. Stephens, or Mr. Samouelle, would give you a natural history of them, it could not but be highly gratifying and instructive to many of your country readers. — *H. J. Brown. Dorchester, May 5.*

Art. IV. *Natural History in Scotland.*

Mr. Neill's Villa at Cannon Mills. — Sir, I shall try to get a friend to sketch Mr. Neill's interesting villa at Cannon Mills, the garden of which has now three hot-houses in it, a green-house, a stove, a vinery, and about 2000 distinct sorts of plants, species and varieties included. In the stove is a living *S*ìren *l*acertìna (*fig.* 80. p. 171.), the only one alive in Europe, as far as I have ever heard; and on Passiflòra quadrangulàris, over the siren's box, may be seen crawling, a live chameleon, which really strongly changes its colour, according to the colour of the substance it is near or in front of; but it takes hours to effect the change. I wish the notice had been drawn up in Mr. Neill's late housekeeper's time; her name was Peggy Oliver; she was housekeeper, cook, and gardener, and, since her death, he has got two maid servants, and a clever young lad as a gardener, and it takes them all to supply her place. Dear Sir, yours, very truly, — *S. R. A. Edinburgh, May.*

Art. V. *Natural History in Ireland.*

The Belfast Natural History Society held their anniversary meeting on the 24th of May. The report of the curator of the museum was read by the president, Dr. James L. Drummond, by which it appears that the number of members, which was last year 67, is now 85; that considerable additions have been made to the museum, by purchase, by exchange, and by donation, and that a portion of the funds has been devoted to the library.

"During the last year, the meetings of the Society were uninterrupted, and a great variety of papers were read; many of these were continuations of subjects formerly commenced. It is to be remarked, that members are beginning to confine themselves more to particular branches of natural history, thus giving to the others the advantage of a regular series of papers. In this way, mineralogy has been fully treated of, especially by one gentleman, Mr. James M'Adam. Entomology has its own admirers. Some individuals have devoted themselves to ornithology, and the first of a series of lectures on conchology was delivered on our last night of meeting. The total number of papers read during the session, is 30; twelve of these were on mineralogy, five on botany, one on topography, two on meteorology, and ten on the various branches of zoology.

"For the purpose of directing to this Society the attention of our countrymen abroad, we have drawn up a circular letter, containing directions for the preservation of objects of natural history, and at the same time requesting their co-operation in furtherance of our views, by sending such specimens connected with our pursuit, as occur in their respective places of abode. In this way much might be done, as there are few persons who have it not in their power to contribute something to a museum; and the members feel they can make a request of this kind without hesitation, as they have no individual right of property in a museum intended solely for the promotion of natural science in this part of Ireland."

The address of the president, Dr. J. L. Drummond, contains a short analysis of the principal papers read, and an eloquent and interesting address on the study of natural history, which, as we have been favoured with a copy, we intend giving in our next Number. Speaking of the Magazine of Natural History, the president observes, "I hope to see many of its future pages occupied with communications from this Society" — a hope which, we are sure, all our readers will earnestly desire to see fulfilled, and for the expression of which we are sure they will join with us in thanking the president and the society. — *Cond.*

Art. VI. *Perennial Calendar for various Parts of Europe.*

Skeleton Form for February. — Flora. The following plants flower, viz. the crocus on the , snowdrop , primrose , violet , hypatica , mezereon , polyanthus , field speedwell , daisy , winter aconite , dandelion , almond , pilewort , and the hyacinth on the .

Fauna. — Fieldfares and redwings remain on the , song of the thrush heard on the , missel thrush , chaffinch , skylark , woodlark . Marsh titmouse begins his spring note , and the blackbird on the . The raven and common owl paired about the , geese lay , and wood-pigeon coos on the .

Meteorology. — The weather, &c. as in January.

(The remaining months of the year will be given in next Number, and the skeleton forms, with the improvements of different correspondents, delivered with the Number for November.)

Art. VII. *Calendar of Nature for London.*

The middle of April to the middle of June.—Flora. The common yellow flag, pink, butter-cup, tulip, hyacinth, jonquil, archangel blackthorn, were all in flower on the 15th; male orchis, 16th; grape hyacinth, 20th; crown imperial, 25th; stitchwort and cowslip on the 26th; about this time, fruit-trees, as apples, pears, &c., generally in flower.

Fauna. Arrived, the chiff-chaff and smallest willow wren, on the 8th; swallow, on the 9th; house martin, 23d; black martin, 23d; field lark, 14th; nightingale, on the 14th; white-throat, 14th; cuckoo, 22d; wryneck, 15th; and orange-tip butterfly, on the 12th.

May. — Flora. The harebell hyacinth, on the 8th; gentianella, 12th; oxlip, 22d; yellow rattle, 20th; herb Robert, 6th; Guelder rose, laburnum, and scarlet thorn, on the 16th; mulberry came in leaf about the 20th; and green peas and cauliflowers appeared in market on the 20th.

Fauna. Young rooks, on the 10th; land-rail heard on the 11th; cockchaffer seen on the 25th; dragon flies, 25th; glow-worm, 26th; rose-beetle, 27th; white angler's-fly, 22d; gad-fly, 24th; fly-catcher and turtle-dove, on the 23d.

June. — Flora. Among the great variety of flowers at present in the gardens, it may only be necessary to notice a few which are met with every where; viz., Fraxinella began to flower on the 2d; spiderwort, on the 4th; orange lily, the 4th; corn-flag or sword-lily, on the 6th; pyramidal orchis, on the 1st; and sweet William, about the 4th.

Fauna. The young of many small birds fly; viz., redbreast, sparrows, hedge-sparrows, blackbirds, thrushes, and starlings; also young magpies, jackdaws, and crows.

The Weather, from the beginning of May to this time, has been a continuation of that we have had ever since the commencement of the year. Changeableness has been its general character. Dry and wet days have succeeded each other; showers and sunshine occurred several times on the same day. Easterly and northerly winds prevailed during the first two weeks of May; but frequently shifting to the opposite points, were, on such change, always accompanied with rain. Thunder-showers have been frequent, and sometimes very heavy, with hail, and sometimes followed by night-frosts. Travellers over extensive tracts of the kingdom have been struck with the appearance of drenched ground in one district, and annoyed by the dust flying on the roads in another, at no great distance. The quantity of rain which has fallen during all this period has been but little more than the waste by evaporation; and though some of the operations in the fields have been retarded by the frequent showers, it was not till the 4th inst. that garden ground received a sufficient share of moisture to reach the roots. For these two or three days last past, the wind has remained pretty steady in the N.W.; should it not veer to the southward again, a dry season may follow, and give opportunity to make and secure the generally abundant crops of hay. — *J. M. Chelsea, 15th June*, 1828.

Art. VIII. *Indicatorial Calendar.*

Numberless are the objects which attract our attention at this season, in the animal and vegetable world. The garden, the fields, the woods, and waters, all teem with organised life. Many of the fruits of the earth have arrived at, and many more are in progress, to perfection.

Animals of the Chase have now a respite from their foes; the crops on the fields prevent pursuit. On the grassy margins of fields, however, hares are often seen, at dawn or twilight, limping and frisking about with all their characteristic playfulness. At the same hours, rabbits issue from their burrows. Foxes, polecats, stoats, weasels, prowl about during the night; and two or three species of the winged individuals of this class, viz., the bats, are seen on evenings, wheeling about and seizing their prey, the nocturnal moths.

Of *Birds*, the young of all sorts are seen. The love-song of the greater number is nearly over, except such as breed late. Rooks are congregated, and, joined by the jackdaw, find their food on open fields or downs; retiring to their roosting-places in high woods, on the approach of night. If the weather proves dry, so that their natural food (grubs) descend into the ground beyond their reach, they will sometimes betake themselves to fields of corn, where they will do much damage, if not scared away in time. If a late brood or two are hatched after the rest, these do not, for some time, associate with the general company, but are led about by the old ones to cherry-orchards, and are often greater plagues to the orchardist than the whole rookery together. Coveys of partridges are often met with; and if before the young can fly, they instantly squat motionless; and it is amusing to see the old ones' pretended helplessness in awkwardly fluttering away, to beguile the intruder from the place; and with what address she steals in a circuit round, to call her young from the too-public spot. The sparrow-hawk is often seen rapidly skirting the hedge, or skimming the fields in quest of young birds; soon as observed, the swallow gives his shrill signal-note of danger, in which he is joined by the blue titmouse and some other birds. The swallow, house-martin, and wagtail, pursue the hawk with threatening cries, secure in their superior power of flight; all others escaping, with cries of alarm, to thickets for safety. Small birds are not alarmed in the same way by the larger kind of hawks. The crow and magpie sound an alarm on sight of the falcon, buzzard, kite, and raven; the three last fly before the audacious crow, but he rarely approaches near the first. The cuckoo, and chief of the migratory birds, are now nearly mute, and begin to steal away imperceptibly. The swift or black martin, almost always on wing round their place of resort, generally leave about the 8th of August; sooner if the season is cold and wet, but seldom later if the weather be never so warm. The sky and wood-larks, with, here and there, a blackbird and song-thrush, are our principal songsters. The notes of other birds are only calls of fear or invitation to each other.

Fishes. — The finny inhabitants of rivers and lakes may be seen variously employed, watching their prey, basking in the sunshine, or roving about in shoals. The springing trout rises in the air to catch the passing fly, and the voracious pike darts like an arrow from his lurking-place, among the heedless fry of minor fish. Of these and sea-fish, the following are in season for the next two months : viz.

Salmon, *S*álmo *S*àlar *L.*
Salmon-trout, *S.* trútta *L.*
Trout, *S. F*àrio *L.*
John Dorée, *Z*èus *F*àber *L.*
Turbot, Pleuronéctes máximus *L.*
Mullet, *M*úllus Surmulètus *L.*
Mackerel, *S*cómber *S*cómber, *L.*
Gurnard, Trígla cùculus *L.*
Sturgeon, *A*cipénser stùrio *L.*
Whiting, Gàdus merlángus *L.*
Haddock, G. æglefìnus *L.*
White-bait, *C*ýprinus, sp. ? *L.*
With other common fresh-water fish.

Of *Crustàcea*, the lobster, crab, crawfish, prawn, and shrimps, are brought to market, with two or three sorts of buccineum.

The *Insect tribes*, which at this time sport in the sunbeam, visit the flowers and tender leaves, or crawl on the surface of the ground, are innumerable. By day, the gaudy butterflies add life and variety of colours even to the parterre. Among them the following are the most conspicuous:— The swallow-tailed *P*apílio Machào*n*, Peacock, Grand Admiral, Orange-tip, Marble, Tortoise-shell, Blue Argus.

By night, the no less splendid family of moths are on wing, but can only be admired when they happen to be disturbed from their retreats by day. The elephant-hawk-moth is a beautiful type of the sphinx family. Beetles, in their metallic-coloured mail, are seen on flowers, on foliage, or on our paths. The stag, tree, hoary, and rose beetles, are met with in gardens; and the variously-marked lady-birds are everywhere, if the green aphides are prevalent. The splendid green cicindella flits before us on dry paths; and many others of this curious tribe. Of the family of bees all are in full enjoyment at this time; the mason-bee is one of the most curious; unlike some of its congeners, its abode is solitary; the habitation built by itself appears like a patch of mud stuck into a small hollow, on the face of a wall. Within this are chambers, lined with leaves, and containing one egg, which, becoming a maggot, lives on the store provided by the mother, changes to a chrysalis, and comes forth a perfect insect in the following spring. The dragon-flies are also an interesting tribe of insects; their four transparent and ample wings, their lengthened, slender shape, and curious mailed structure and colours, and their habits of hovering over ponds and banks of rivers, where they are bred, sufficiently point them out to the notice of the naturalist. The largest of the genus known in this country is the Libéllula grándis. This magnificent insect may be often observed in shady walks or lanes, darting with astonishing velocity after every fly that passes, and on which he preys. The house-fly (*M*úsca doméstica) does not enter houses till the wet or cold of autumn drives them in; but there is another fly which, exteriorly, much resembles it, and which is often troublesome in the ensuing months; this is the Stomóxys cálcitrans, or stinging fly, one of the greatest plagues to cattle, as well as to persons wearing thin stockings. The invisible harvest bug (A′carus *R*ícinus), the common gnat, and musquito, are also troublesome to those whose delicate skin may be exposed to their unsuspected attack. Young frogs change from their tadpole state.

The *Vegetable Kingdom* is now in full developement; the ripening corn, and the fertile fruit-trees bending under their swelling burthens, are, together, the effects and the reward of industry, and the offspring of the bygone months. The garden glows with all the tribe of annual flowers; a few perennials still adorn the flower-borders, which need not here be named. Those who admire and find amusement in searching for the spontaneous gems of Flora, may discover a few by visiting the fields where the cockle (Agrostémma *G*ithago), the foxglove (Digitàlis purpùrea), bluewort (*C*entaurèa *C*ỳanus), frog's-mouth (*A*ntirrhìnum Linària), and several others appear. The marshes and meadows yield the *C*árduus palústris, the *Œ*nánthe pimpinellöìdes, *G*entiàna amarélla, Lȳthrum Salicària, *S*piræ'a *u*lmària, Bùtomus umbellàtus, and *R*ùmex marítimus. Near woods may be seen, the *H*ypéricum perforàtum, &c.; and on heaths or waste ground, besides the general covering of ericas, ferns, &c. may be seen the Campánula rapunculöìdes, Campánula rotundifòlia, and many less conspicuous.

As changeable weather has continued ever since the beginning of the year, it is probable that at midsummer it may become more settled.

Astronomical Indications. — In the course of the two following months, the Moon will be with the Planets, as under: viz.

July 12. at	9 A.M.	Saturn.	August 8. at	10 P.M.	Saturn.
13.	3 P.M.	Mercury.	9.	1 A.M.	Mercury.
13.	12 A.M.	Venus.	9.	2 A.M.	Venus.
20.	6 P.M.	Jupiter.	17.	5 A.M.	Jupiter.
24.	10 P.M.	Mars.	21.	10 P.M.	Mars.—

June 15. 1828. J. M.

Art. IX. *Queries and Answers.*

Putting Bees in mourning.— In answer to the question (p. 93.) respecting putting bees in mourning, I beg to inform you that I have heard of a similar, or even greater, instance of superstition in this neighbourhood, viz. that in the event of the death of any of the family, it is necessary *to inform the bees of the circumstance, otherwise they will desert the hive, and seek out other quarters.* — *W. T. Bree. Allesley Rectory, near Coventry, May* 23. 1828.

A Natural History Conversazione, — Sir, Your correspondent J. W. of Cambridge has informed us, that Professor Henslow holds a natural history party every Friday evening. If information could be obtained through the medium of the Magazine of Natural History, as to the manner in which subjects are introduced and discussed at this or any other similar meeting, we in the country might be enabled to imitate, at humble distance, these pleasing conversaziones; and you would merit the thanks of many amateurs of the science, and particularly of yours, — *An Admirer of Nature. Ipswich, June* 5. 1828.

All that is necessary is, the time and place being fixed on, to lay on the table a few remarkable objects in natural history, specimens of animals, vegetables, or minerals, and a few good books on the subject, and especially books of plates. Serve tea and coffee of the first quality, and these will promote the conversation that will naturally arise among the individuals present on the subjects before them. — *Cond.*

The common Rose-wood of Cabinet-makers (in answer to the Rev. G. M., of Lynn) is the root of the *C*onvólvulus *s*copàrius, common in the Canary Islands, in Rhodes, and Cyprus. There is also a rose-wood sent from Jamaica, which is the timber of the *A*mȳris elemifera; and, from the Antilles, the timber of Ehrèt*ia* fruticòsa, and from Cayenne, that of Licària guianénsis, is also sent under the name of rose-wood. (*Dic. Class. D'Hist. Nat. Art. Bois.*)

Forming an Herbarium. —There are so many different ways of forming an herbarium, that one is quite at a loss which to pursue: you would confer a great obligation on many of your readers, by giving particular directions for the purpose. — *The Rev. George Munford. Lynn Regis, Norfolk, May* 22.

1828. Till some correspondent favours us with more particular directions, we recommend the specimens to be dried between leaves of paper, under the pressure of a bag of sand or small shot, and, when perfectly dry, transferred to a bound specimen-book, and sewed (not gummed) to its leaves, in the order of gathering the specimens. The name should be attached to each specimen by a slip of paper. In the course of three or four years, two or three thousand specimens will have been dried, and these may then be transferred to another book or books, arranged according to the natural system, gummed on, and their names, &c. written beside them. The mode of forming the book for this purpose is as follows: — Suppose the size to be folio; then gum the specimens on one side of leaves of drawing cartridge-paper, paste a leaf of reddish-brown blotting-paper on the back of the leaf containing the specimens, and paste a margin of cartridge-paper all round both sides of each leaf, say half an inch broad at top and bottom, and the outer edge, and 1 in. broad at the inner or binding edge. This being done, put each leaf separately in a press, and let it remain there till it is pressed quite flat. Proceed in the same way with as many separate leaves as will contain all the specimens to be arranged, or as many as will make a proper sized volume; and then send them to a binder, to be bound in the usual way. The effect of the double edge will be, that each page of specimens will, as it were, lie fastened to the bottom of a shallow drawer, completely excluded from the air; and the volume may be kept in a book-case along with others, in the usual way, and, by its index, referred to with as much ease as any other botanical work. This is by far the best method of keeping specimens that we know of, for small collections; and we would strongly recommend all those who can afford it, to employ Professor La Gasca (*Gard. Mag.*, Vol. II. p. 220.), to form books of this sort, containing one or two species under each order and tribe of the natural system. There could not be purchased a work of equal value to the young botanist. Mr. Toward, flower-gardener to the Duchess of Gloucester, is the only person that we know of who possesses an herbarium done up in this way, and to him belongs the merit of the invention. The binder was Mr. Perryman, of Windsor, himself much attached to botany. (See *Gard. Mag.* for August, 1827.) — *Cond.*

How to commence the Study of Botany. — A young man, desirous of commencing the study of botany, would feel extremely obliged by a few remarks on the most efficient mode of commencing the study, so as to make gradual proficiency without the assistance of a teacher; he being so situated as to preclude the possibility of obtaining verbal instruction. What books should he obtain? and how may he obtain a correct knowledge of the technical terms used in the science? A few remarks by yourself, or a correspondent desirous of being useful to the young student, would confer an obligation on, Sir, &c. — *An Admirer of Nature. Ringwood, May* 10. 1828.

Drummond's *First Steps to Botany*, London, 12mo, 2d edit., 200 figs., 9*s*., we consider the best book to commence with; and next Smith's *Introduction*, and Hooker's *Flòra Scótica*, or perhaps the forthcoming edition of Hull's *Flòra A'nglica*, may be resorted to. While these books are studied, as many specimens of plants should be gathered and dried as possible, and their names ascertained from the nearest gardener. There is but little to be done in the study of botany without first storing the memory with the names and images of a number of plants of common occurrence. By gathering specimens (if only a single leaf of each plant), laying them between the leaves of a book of any sort, one on each page, and writing their names beside them, and afterwards turning them over two or three times a day, the names and images of all the plants of a garden or neighbourhood may be fixed in the memory in the course of a week or two. When this has been done, the student may turn to Hooker or Hull, and compare the descriptions there with the specimens. This will teach him the application of technical terms, and he may afterwards be able to discover the name of any plant by finding out its class and order, generic and specific distinctions. — *Cond.*

*The Lemming or Scandinavian Rat, M*ús Lémmus *Lin.*, Campagnol (*campana*, a bell; bones of the head in that form ?) Lemming *Cuv.*, which, after a wet season, is known to descend in myriads from the great mountains in the north, and to deluge the adjacent plains, as it is supposed, in its way to the sea, proceeds, as naturalists inform us, in so straight a line, that no object is capable of turning it out of its way, and that, sooner than alter its course, it is known to prefer even death itself. If, as they inform us, this curious creature happens to find a large fire or a deep well in its way, instead of going round either of them, in the one instance, it boldly darts through the flames, and, in the other, resolutely proceeds down one side and up the other; in both cases, in imminent danger to itself. Similar phenomena are related, though not to such an extent, of the Bahama lobster; and naturalists seem to rest content by informing us that these creatures obey, in this manner, some extraordinary impulse, or some wonderful law of nature, from which it is impossible for them to diverge; but yet they seem to have made no inquiry as to why such should be the case. Animals, as well as mankind, migrate for various reasons, but most generally to obtain a better home than the one they already possess; but in the case of the particular animals of which I have spoken, it is their persistency in a straight line which is so truly astonishing. Do you think, Mr. Editor, that this phenomenon can have any thing to do with optics, and that their eye being so constructed as to hinder them from seeing in any other than a direct line, may not impel them to pursue their route in the manner they do? — *C. May*, 1828.

The Foul Water of Fishermen. — The St. Ives fishermen took but few mackerel last week; they have met with large spots of what is called "foul water" in the fishing ground, from five to ten leagues off the coast. The nets, when in this water, which frequently extends to a considerable distance, are covered with a glutinous and exceedingly offensive substance, from which it is found difficult to cleanse them. (*Exeter Alfred, May* 29.) What can this be? Is it any excrementitious discharge from the shoals of fish? — *M. June*, 1828.

Standard of Colours. — Speaking of colours, it really would be important to naturalists and artists if a standard diagram of colours were established, (and, if you please, deposit it in the Tower with weights and measures). The original should be in stone, and authenticated copies may be issued in metallic colours. Thus any tint could be referred to by number or name. You are nearer to the useful Secretary than myself, and should ask Mr. Peel to add it to his list of desirables. — *B. M. Bromsgrove, March* 3. 1828.

Art. X. *Retrospective Criticism.*

The late James Sowerby, Esq., F.L.S. the projector, draughtsman, engraver, and in part author of the "English Flora." — Sir, On reading the memoir of the late Sir James Smith in your Magazine of Natural History (p. 91.), I perceive that one of the works of which he is stated to be the author (viz. *English Botany*) is so mentioned as to give the whole merit of that laborious work to this distinguished botanist. There can be no doubt that Sir James, by his great talents, is entitled to the warmest praise of his countrymen; still it is but justice to those who have prosecuted with equal zeal the study of nature, that the late Mr. James Sowerby's name should be stated as the projector of that great and useful work, and that Sir James was employed to furnish the descriptions of the plants; it being found by Mr. Sowerby (after writing a part of the first volume himself) that to make drawings, and engrave all the native plants of the British empire, was as much as he could expect to attain in a reasonable period; and the accomplishment of the work fully proved that it required the persevering industry of twenty years for its completion.

Perhaps I ought to apologise for occupying your time with that which may be generally known among your scientific readers; still, as many persons will be induced to peruse a publication which presents the works of nature in so pleasing a manner, but who may be unacquainted with English botany, I have taken the liberty of bringing this subject to your remembrance, that you may give it publicity in your pages, should you feel so disposed, in order that the great merits of the late Mr. Sowerby may not be overlooked, while we are paying homage to the distinguished talents of Sir James Smith. I am, Sir, &c. — *B. London, May* 14. 1828.

To be aware of the extraordinary talents and great industry of the late Mr. Sowerby, and of the present family of this name, we have only to imagine the works on natural history published in Britain during the last fifty years deprived of their graphic illustrations. There is scarcely a botanical or zoological work of the present day which does not depend principally on this family for its most attractive features: none is more indebted to it than this Magazine. — *Cond.*

☞ *More loveable than wise.* — My dear Sir, We all know how common it is for a long argument to end in both parties discovering that they had been of the same opinion from the first, and the difference had arisen from the use of some inappropriate term, or from a different conception of certain words. A. observes that his friend B. is a very pleasant old gentleman. "Not so *old*, neither," replies B., senior; "you are greatly mistaken there." Both parties have precisely the same idea of the number of years B. has lived; but the father and son have different notions of the word *old*. So, it is very probable that I differ in words only with your correspondent Conchilla. "Of the two," says this lady, "I would have my fair countrywomen *loveable* rather than *wise*." As this is a matter in which the whole sex are concerned, I must beg leave to protest against setting loveability in opposition to wisdom. The happiness of a woman is so much in the power of her affections, that to be loveable is of the first importance to her. I am far from undervaluing the greatest of all charms — this charm composed of a thousand others, each adding lustre to the rest; on the contrary, I object that Conchilla does it less than justice, in depriving it of that by which it chiefly exists. Surely, she who is most wise, will be likely to be the most loveable. A very silly woman is seldom very attractive; and a truly loveable one, however mediocre or uncultivated her understanding may be considered, can scarcely be destitute of wisdom. There are some women, whose natural sweetness is such, that they seem, as a friend once observed to me, to have attained the result of wisdom, without going through the process. Sweetness of temper, alone, is an attraction truly loveable; and is not sweetness of temper an intuitive wisdom? Yet, in proportion as she is wise, how many attaching qualities may unite with sweetness of temper, to render a woman loveable!

It has been observed to me, that the word *learned* would have been better than *wise;* and, had the phrase been so worded, I should have acquiesced in silence, without presuming to offer objection or comment. It is not improbable that such was the interpretation intended by the writer; in the careless phraseology of conversation, learning and wisdom are so frequently confounded, that it is by no means unlikely that a hasty pen should pass on without staying to discriminate between them. I would readily agree with Conchilla, that it were better a woman should be *loveable* than *learned;* but

I would say also, that as learning will not necessarily render her less amiable, if she have inclination and leisure, there is no reason why she should not be both learned *and* loveable; and to this remark, I suspect, it will be wise in Conchilla to assent.

Some other passages in the Magazine would tempt me to remark upon them; but lest, by my own showing, I should prove myself to be the most unloveable of women, as being utterly destitute of wisdom, I will here conclude, remaining, Sir, yours, &c. — *Anglica. Saturday, May* 31.

Deciduous Scale on the Bills of Birds. — Mr. Yarrel has the credit of having first brought into notice the fact, that the bills of birds are, before they are hatched, strengthened by a deciduous scale, which enables them to perforate and burst the shell. (*Jennings's Ornithològia*, p. 63.) This circumstance, however, has been long known to rural housewives; for, as soon as the chickens are hatched, the first care bestowed upon them is, displacing the scale with the nail of the thumb, to enable the young to pick up their food. — *J. M.*

Translation and derivation of Technical Terms. — I take the liberty of saying that the practice you have adopted of translating the technical terms, and giving their derivation, is a very unpleasant one to the reader, and rather distracts him than otherwise. The translations, derivations, and accentuations might, I think with advantage, occupy, as a glossary, the last page of the Numbers. — *A. Berwick, May* 31.

We hardly expected to be blamed for the very great trouble we take, and the expense that we incur with the printer, in giving the derivations complained of; but perhaps it is good for us to be chastened, for too much labour is as bad as too little. We acknowledge the unpleasantness complained of, but thought, and still think, the translations and derivations likely to have the best chance of being remembered when given where they occur; but perhaps they are not worth remembering, and if other readers are of the same opinion as A., we shall relinquish the practice. We mean to introduce all the important translations and derivations of technical terms, and scientific names given, into the general index at the end of each volume, where they will remain for future reference, as we do not intend to give (often at least) the translations and derivations of the same words twice. — *Cond.*

The Perennial Calendar for various parts of Europe. — By noticing more particularly the wild plants, their affinities to birds and insects will be at length perceived; and we might have (what I have often wished to see) a calendar by which the flowering of a plant should acquaint us with the appearance of a bird, and the appearance of an insect tell us the flowering of a plant. Undoubtedly there will be less trouble in generalising, by having, as you propose, a select number of plants and animals marked out the same for each station; but if facts and useful observations are to be gathered, do not confine the observer to these; let each, in addition, insert what is most applicable to his own locality, and interesting facts may then be obtained from each station. It is astonishing how many curious circumstances in natural history have been noticed and forgotten, for want of a register to record them. This being no longer the case, it is to be hoped that every naturalist will produce his store, that whatever is valuable may be gathered before it is too late. Would it not also be generally useful to have a list of the less common wild plants of each station? We look into our *Flòras*, and perceive the habitat of a rare plant put down in a place probably 150 miles from us, while perhaps it is lurking in our own vicinity all the while. To the traveller, to the botanist, and to the young enquirer, how useful would such lists be! — *Edwin Lees. Worcester, May* 8. 1828.

THE MAGAZINE

OF

NATURAL HISTORY.

SEPTEMBER, 1828.

Art. I. *Some Account of an Ascent and Barometrical Measurement of Wha-ra-rai, a Mountain in the Island of Owhyhee; extracted from the MS. Journal of Archibald Menzies, Esq. F.L.S.* Communicated by Mr. Menzies.

Whilst His Majesty's ship, the Discovery, commanded by Captain Vancouver, lay in Karakakooa Bay, in January, 1794, I was very desirous of employing my time in examining the mountains and interior parts of the island, to collect plants, seeds, and other natural productions. For this purpose I consulted with Ta-maiha-maiha, king of the island, to obtain his permission; and he not only complied with my request, but very obligingly promised that I should be attended by a chief, who would have sufficient power to protect me from any ill treatment, and provide for whatever provisions and attendance I should require in my excursions. He then wished to know what part of the island I meant to visit, when I told him that I proposed first to ascend, if possible, a considerable mountain, of a conic form, called Wha-ra-rai, situated a little to the southward of Toe-hah Bay. He then fixed on a chief named Harou, who had the charge of his own plantation at the village of Hanua-oora, near the foot of that mountain, to which place he advised me to go by water in one of his canoes, and there I should be supplied with every thing necessary for my journey. Harou being at this time alongside of the ship, he called him in, and gave him a most solemn charge of me, and every thing I should carry with me; declaring that if I should have occasion to prefer any complaint against him on my return, he should suffer for it most severely.

The business being thus settled, Mr. Swaine, one of the lieutenants, and two or three gentlemen of the quarter-deck, volunteered to accompany me; as did also a Mr. Howel, an

American gentleman, who had lately arrived here from China, with an intent to remain some time at these islands; and I was very happy in having the pleasure of their society.

Every thing being ready, we set out on the morning of the 16th January, in company with Teamotoo, the chief of the district, and his wife, in a large double canoe, followed by Harou and our attendants in another; and, as we were passing the village of Kow-rowa, we were joined by Mr. Howel and his attendants in his own canoe. After this we proceeded to the northward close alongshore for about four or five miles from Karakakooa, when we entered a small cove surrounded by a scattered village belonging to Teamotoo. In this cove we saw the American schooner, which the natives had some time before captured with considerable cruelties. She was secured and housed over to preserve her from the weather, but we did not examine her condition closely, for fear of giving offence; we were told that she made a great deal of water, which they were obliged to pump out daily, otherwise that she would sink.

We met here a seaman, who had landed from an American vessel some time before, and now employed himself in making charcoal, and laying up a store of it for any vessel that might be in want of such an article for working the forge. This was a useful hint for the natives, not only for working their own iron with greater facility, but likewise as a new article of traffic, of which they eagerly availed themselves; for, on our coming into Karakakooa bay this time, we were quite surprised to see the natives bring alongside quantities of very good charcoal to dispose of. This man made choice of a delightful airy situation for his dwelling, which was kept neat and clean, and from which he had a commanding prospect of the cove and village underneath, of a large extent of country on both sides, and of the boundless ocean before him. We all dined with him on roasted pork, roasted fowls, and vegetables, in a very comfortable manner, as he had taught the natives who waited on him to cook and serve up his victuals in the English style. After dinner we entertained him with a glass of good grog, to which he said he had long been a stranger; this induced us to spare him a little of our stock of liquor at parting, when he earnestly requested us to send him some more, and likewise some tobacco, as soon as we returned to the vessels.

We here parted with our friend Teamotoo; and, on taking leave of us, he desired that, if our route should chance to pass through any of his plantations, we would demand whatever we wanted, and for this purpose he sent with us a person duly authorised.

We again embarked, in the cool of the evening, with our conductor, in one of the king's large double canoes, and proceeded on to the northward till we reached Tai-ta-tooa Bay, in the bottom of which we landed at the village of Hanua-oora, under the noisy acclamations of a numerous group of men, women, and children, who expressed their joy by singing, dancing, and capering before us in such a frantic manner, that it was with great difficulty the chief could clear an avenue through them. He conducted us to a large house belonging to the king, which we were happy to find was within a *tabooed* space, so that we soon got clear of their teasing curiosity, and enjoyed our evening's repast and night's repose in quietness; but the chief himself was up most part of the night, preparing for our journey inland, which was to commence from this place; and, as it was likely we should be some days in the mountains, it was necessary to provide provisions of every kind, with a quantity of cloth and mats for our bedding at night, and men to carry the whole; so that the collecting and arranging of these matters was a weighty concern on Harou's mind.

As it was my intention to ascertain the height of the mountain we were going to ascend, I brought with me a kind of portable barometer, for which I was entirely indebted to the liberality of the late Colonel Gordon, at the Cape of Good Hope. That gentleman, when he understood that we had no portable barometer on board for ascertaining the height of any mountain that might be ascended during the voyage, presented me, in the most generous manner, with his own, which he had long been in the habit of using in the interior parts of Africa, and which had accompanied him in his interesting journeys through that country for many hundred leagues. The simplicity of its contrivance, and the ease with which it is carried and managed, may probably render it preferable, on such occasions, to a more expensive instrument, which, in ascending pathless rugged mountains, is so liable to be broken. I shall, therefore, subjoin a short description of it, and the manner of using it, leaving the reader to judge of the probable degree of accuracy of the observations made with it at different heights, both in this and in my subsequent journey to the summit of Mowna-roa.

It consists of a straight glass tube, about 3 ft. long, filled with mercury, which was doubly secured by a small stopper, and a piece of soft leather tied over the end of it; this tube, together with a brass scale of about the same length, divided and subdivided into inches and tenths, was placed in a small wooden case, lined with cloth, where the scale was made fast, but the tube had a little play: these, with a few ounces of mercury, carried in a stone or wooden bottle, completed the whole apparatus.

For observing with this instrument, the mercury in the bottle is to be poured into a small open cup; the stopper is then removed from the tube, and the vacancy in it must be filled up brimful with mercury; then, with a finger placed over the mouth of the tube, that end of it is to be inverted into the mercury in the cup, taking care not to withdraw the finger until it is well immerged. The mercury in the tube will then instantly sink down to its proper height, according to the weight or pressure of the atmosphere on its external surface at the time and place of observation; and all that is further necessary to be done is to hold the tube quite upright, and measure, with the brass scale, the exact height of the column of mercury in the tube above the surface of the mercury in the cup, which will give the true height of the barometer at each station.

I had but one tube, which I was fortunate enough to preserve whole in my different journeys; but, to guard against accident, several of these tubes may be loosely packed in the same case, by rolling each of them up in a piece of cloth; and it is almost needless to observe, that, in carrying them, the stopper ends should be kept uppermost. This case may be slung on a man's back, and carried with ease and safety over the most rugged mountains.

On the morning of the 17th we had much difficulty in getting the party ready, and collecting together the provisions for our journey, which consisted of live hogs, poultry, taro, yams, cocoa nuts, and dried fish, in quantities that loaded upwards of twenty men; but it was not possible to ascertain the number of carriers attached to the party, as some were sent on before, and some in different directions, to collect their loads, with orders either to follow or meet us on our way up. There were others appointed to carry our luggage; one carried a kettle, another a gridiron, and a third, from the nature of his office, might be termed a butler, as he took charge of our liquor-case. Among other appointments we found that each of us had a man, whose sole business was to carry the cloth and mats for sleeping on, spread the couch at night, and roll it up again in the morning; in short, there was no end to these various appointments, where the claimants for service were so numerous. Many of them, however, were unwilling to take a heavy load, but merely took some little thing or other, that they might be considered as belonging to the party, and by that means be allowed to accompany us;

indeed, there was no possibility of making any retrenchments whilst we were in the midst of such bustle and confusion, and surrounded by such a numerous group of the natives.

We therefore set out in the forenoon, in the best manner we could, for the mountain, which was directly back from the village; but, a little before our departure, I observed the barometer at high-water mark, where it stood at 30 in. 10 pts., and the thermometer in the shade was at 81°. At first our progress was slow, being exposed to the scorching heat of the meridian sun, over a dreary barren tract, of a gradual ascent, consisting of little else than rugged porous lava and volcanic dregs, for about three miles, when we entered the bread-fruit plantations, whose trees, with spreading boughs and beautiful foliage, were scattered about, at this distance from the shore, along the side of the mountain, as far as we could see on both sides. Here the country began to assume a pleasant and fertile appearance, through which we continued our route for about two miles further, surrounded by plantations of the esculent roots and vegetables of the country, industriously cultivated, till we came to the uppermost village, consisting of a few scattered huts, where we were importuned by our conductor to take up our abode for the night; and though we were impatient to go on as far as we could with daylight, yet we were obliged to comply with his request, as he wanted, he said, to muster his party, and make up any deficiency in our stock of provisions, before he quitted these plantations; it also gave him time to send messengers back to Hanua-oora for whatever was forgotten or wanted.

From this place we had a delightful view of the scattered villages and winding shore underneath us, and of the luxuriant plantations around us; but a thick cloud enveloped the mountain and woods above us, from which, in the evening, we had light refreshing showers of rain.

Next morning the clouds dispersed, and gave us a fine prospect over the woods of the naked peak of Wha-ra-rai, which did not appear to be farther from us, in a direct line, than the village we had quitted at the sea-side. This gave us fresh spirits, and we set out pretty early, in expectation of soon accomplishing our object. After travelling about two miles by a narrow path, through an uncultivated tract, overgrown with ferns and small bushes, we entered the forest, the verge of which was adorned with rich and fruitful plantations of bananas and plantains, from which we supplied ourselves with a good stock for our journey. We then penetrated the wood by a winding path, so narrow that we could only follow one another; and in this manner we proceeded for about three estimated miles, when we came to a resting place, lighted a fire, and breakfasted. Here I observed the barometer at nine in the morning, and found the mercury stood at 27 in. 35 pts.; so that it had fallen, by our ascent, since yesterday morning, 2 in. 75 pts., which gave our height at this station only 2660 ft. above the level of the sea. The thermometer was now at 59°, which showed that we had already changed our temperature of climate 22°.

After breakfast, we continued our journey by the same circuitous path in the woods, for about seven or eight miles, according to our estimation, when we came to the end of it, where we found a small hut that appeared to have been lately occupied by some of the natives, who had been thus far up the mountain, felling of trees, and shaping them out in the rough for canoes, planks, and other purposes; and, as it is necessary to make a path for dragging these down to the sea-side, this place appeared to be the farthest extent they had yet penetrated up the mountain for timber.

Here we were advised by our guide to stop for the night, as many of the party who were under heavy burdens, he said, had lagged behind, and were so tired, that they could not proceed further without some refreshment and a night's rest; besides, he assured us that we were near the upper edge of the forest, and would, with ease, reach the top of the mountain early next day. We therefore took his advice; and, as the party arrived, they in a short time erected a village of small huts, to shelter themselves and us comfortably for the night.

Since we entered the wood in the morning, our view was limited by a continued dense forest of trees, bushes, and tall ferns, on both sides of our path, so that we saw neither the sea nor the mountain, though the day was quite clear and serene all the time. In many places we found the wood had been thinned, by the natives having cut down the larger trees for domestic and other purposes; this afforded a good opportunity to botanise as we came along, by keeping several of the natives employed on both sides of the path, in bringing me branches of whatever tree, bush, or plant they could find either in flower, fruit, or seed.

We observed here and there, on the side of our path, little consecrated spots, pointed out to us by *taboo* sticks, stuck in the ground, near a bush or under a tree; in passing these places, the natives always muttered a prayer or hymn, and made some offering, as they said, to their *Eatooa*, or god, by leaving a little piece of fruit, vegetable, or something or other, at these consecrated spots. Even in this distant solitary hut, we found a corner of it consecrated by one of these *taboo* sticks, which the natives earnestly requested us not to disturb or remove when we took possession of it: and we strictly obeyed their injunction, conceiving that sacred places and religious forms, whatever they are, ought to be held equally inviolable everywhere; for the untutored savage, in worshipping his god in a gloomy forest, may be as sincere in his prayer, and, probably, may derive as much consolation from his religion at the awful moment of dissolution, as many more enlightened, who habitually bend the knee before a rich altar, and offer up their devotion in a splendid temple.

Finding we were so near accomplishing our object, a messenger was despatched to Karakakooa, to make our progress known at the vessels, and to bring from thence some things wanted to render our situation comfortable on the mountain.

In the evening, the thermometer stood at 58°; and I was much surprised to find the temperature so nearly the same as it was in the lower part of the wood in the morning, though we had ascended, since that time, upwards of 4000 feet of the mountain. This was probably owing to the strong and constant exhalations going on in the daytime, amongst the aggregate assemblage of vegetables in this dense forest; keeping up a fanning breeze amongst the boughs, and tending greatly to diffuse the same temperature, even at different heights, throughout the woody regions of these mountains. But when this cause ceased at night, and a heavy dew or small rain produced a contrary operation, the temperature next morning was found to be very different, for the thermometer then was as low as 43°, at half past seven; which, in this instance, showed a difference of about 16°, between the extremes of what may be termed the temperate zone of these mountains.

As we were now very eager to gain the summit of the mountain, we set out pretty early on the 19th, even contrary to the wishes of our guide and the rest of the natives, who, notwithstanding large fires being kept up, were continually coughing the whole night, and now complained so much of the cold, that they were unwilling to stir till the day advanced; and well they might, for, besides the effect of the damp chilly air of the forest upon their constitutions and thinly clad bodies, they also powerfully felt the change in our temperature, of nearly 40° by the thermometer, since we left the seaside, in the space of little more than as many hours.

The forest here being thinner of trees, and less encumbered with ferns and underwood, we began our progress, with a few attendants to direct our course, as there was no path; and in about half an hour we got out, at the upper edge of the wood, where we saw the summit of our mountain at no great distance. The grass here was found covered with a heavy dew, partaking a good deal of the nature of hoar frost, which was so chilly and pinching to the bare feet of the natives, that they could not endure it, but were obliged to stop and kindle a fire, till the influence of the sun had reached them. We therefore left them to follow us as they could, and continued our ascent up the peak, which was steep and rugged, but thinly covered with grasses, and little thickets of low shrubs. These may be considered as the alpine plants of this island, most of which were entirely new to me, and, though there were but few of them in flower, yet their variety, and the novelty of the tract, gave new life to my steps, and enabled me to reach the top of the mountain exactly at half past eight. The rest of the gentlemen followed me pretty close, and by ten the whole party crowded the lofty summit of Wha-ra-rai.

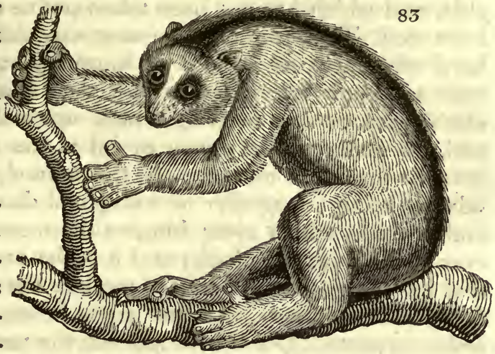
As I observed that we were accompanied by a number of idlers, who were unwilling to burden themselves, I took the opportunity, as the party arrived upon the summit, to mark all those who were well loaded, by tying a piece of variegated tape round the arm of each, as a badge of distinction, telling them, at the same time, that on producing these badges, when we returned to the ship, they should be well paid for their service, whilst those who brought up small loads would receive but little. This induced several of the idlers to return to the plantations for loads, and as they arrived with them each had a similar badge; but if any of them, after this, misbehaved, or was not sufficiently careful of what was entrusted to his charge, he was discarded, by taking his badge from him; this produced an emulation amongst them, which had a wonderfully good effect during the remainder of our excursion.

(*To be continued.*)

Art. II. *Descriptive Notice of a Specimen of Lèmur tardígradus* Lin., Màkis *Cuv., kept alive for some Time at Edinburgh.* By W. Baird, Esq. Communicated to the Plinian Society in May, 1827.

The Lèmur (*lemures*, ghosts; resemblance to man) tardígradus, Slow Lèmur, or Tailless Maucauco (*fig.* 83.), has been described by Linnæus, Buffon, and others; but, perhaps, as to manners and habits, most accurately by Vosmaer and Sir W. Jones, whose descriptions may be seen in Shaw's *Zoology.* He is placed by Linnæus next to the monkeys, as a connecting link between them and other animals, under the genus Lèmur; and by Cuvier, under the quadrumanous animals.

The genus Lèmur of Linnæus (the *Màkis* of Cuvier), including animals with long tails and great swiftness, as the Lèmur cátta and the Lèmur *macàco*, &c., and animals without tails, and remarkable slowness of motion, as the Lèmur tardígradus, &c., has been split by Cuvier into several divisions, after the example of M. Geoffrey. Two of this singular genus are remarkable for their slowness of motion, and have been formed by that naturalist into a distinct genus, the *Lòris* (*loeris*, a clown, *Dutch;* name in Ceylon). This species is the Loris paresseux. (See published account, *Philos. Journal*, June, 1827.)



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Though he has been described by two or three different authors, and from live specimens, there are some particulars connected with his organisation, which apparently have not been taken notice of by any author I have been able to consult. A short description of his form and nature, therefore, as far as they have come under my notice, may not be uninteresting.

The specimen described, I obtained at the beautiful island of Pulo-penang, or Prince of Wales' Island; and as I now have had him in my possession upwards of nine months, and as no change has taken place in his growth in that time, I should consider him as a full-grown animal. He is one of the male sex, of a dusky ash colour, and is particularly well marked by a line of dark brown, running along the back; his whole body is covered with a thick short fur; a covering which is rather unusual in hot climates, but which seems well adapted for his habits and manners. His head is almost round; the face sharpened at the extremity; ears short and flat, but wide and large otherwise. His eyes are large and very prominent, almost hemispheres in shape, and very much approximated; they are of a yellowish brown colour, and are surrounded by a circle of dark brown, the same colour as that on the back. They shine brilliantly in the dark, especially when animated, glowing like heated furnaces; eyelashes short and black. When he closes his eyelids, he does it in a manner different from any other animal I have seen; instead of closing them by moving them together, upwards and downwards, he draws the skin diagonally from the sides; a peculiarity rather remarkable, and which has not been taken notice of by any author I have seen. This, too, he does most especially when eating any hard substance, as a piece of lump sugar, &c. All the animals we know belonging to the class Mammàlia, like man, close their eyelids in a direction, upwards and downwards, and, in general, the upper eyelid is the one possessing the greatest degree of motion. In this animal, however, the eyelids are brought together in a diagonal direction, or outwards and inwards, which gives him, at the moment of shutting his eyes, a most peculiar look; and it is the under or outer eyelid that has the greatest degree of motion, the upper or inner one being almost fixed. At first sight it might appear that, in order to possess this lateral motion, the muscular apparatus of the internal eye must deviate from that of the animals of the class Mammàlia; and that a separate muscle must be in existence, attached to the outer or lower eyelid. Upon looking more attentively, however, we discern the inner canthus of the eye situate very low down in the face, and this circumstance, perhaps, may account for the manner in which he shuts his eyes. The orbicularis oculi muscle must be very powerful; and from this position of the inner canthus, and the insertions the muscle being, in consequence of this, also low down in the face, it will act chiefly on the outer or lower eyelid; and drawing it towards the inner one, which is only partially movable, thus close the eye in a diagonal direction. It is very much to be lamented, however, that Sir A. Carlisle's attention had not been directed to this peculiar appearance, before he disposed the specimen he had possession of; as the existence of a separate muscle attached to the lower eyelid, would constitute a remarkable deviation from the anatomy of the eyelids of the rest of the Mammàlia.

Reptiles, such as the frog, &c., have the same lateral motion of the eyelids as in the Lèmur; and these animals possess a separate muscle for this movement. * His pupil is very small, being very much contracted during the day. His fore legs terminate in hands like those of a monkey, with a soft, smooth palm, a thumb and four fingers, each provided with a small

* The specimen died in the beginning of this year (1828), after Mr. Baird, the author of the paper, had left the country on a second voyage to India. The eye was dissected by an eminent comparative anatomist, Dr. Knox of Edinburgh, who found that the peculiar movement of the eyelids above described did not depend on any peculiar structure, but merely on the greater degree of strength of the orbicularis muscle. The lungs of the animal were found to be in a diseased state; and some parts of the skeleton were affected with eruptive appearances, similar to those which occur in apes brought from warm to cold countries. — *P. N.*

round nail. His hind legs are much longer than his fore ones, and are prehensile; the great toe or thumb is placed nearly at right angles with his other toes, and is evidently formed for grasping branches of trees, &c.; the index toe, or fore finger, however, of the hind foot, has a peculiarity; instead of a round nail, as all the other toes and fingers have, it is provided with a sharp sickle-formed claw, somewhat like that of the dog. This I have frequently seen him make use of in scratching himself, of which he is very fond. He has no tail, but there is a prominence in its place, which is very visible when he walks.

A very remarkable appearance is presented by his tongue; and though a specimen of this animal was dissected by Sir A. Carlisle, a good many years ago, this anomalous appearance has not been mentioned by him, and has been totally overlooked by all the other authors who have described him. Beneath the tongue proper, if I may so call it, which is somewhat like that of the cat, though not rough, is another tongue, white-coloured, narrow, and very sharp-pointed, which he projects along with the other one when he eats or drinks, though he has the power of retaining it within his mouth at pleasure. I have not been able to see any particular use to which he applies it; but, from its sharpness, it would appear as if it were formed for puncturing soft fruits, of which he is very fond, and which form great part of his food. Perhaps it may be formed for catching insects, as Sir W. Jones mentions that his specimen was very fond of grashoppers, and once or twice this animal has been seen to eat spiders. I have also found him to be exceedingly fond of flies; he snaps them up most eagerly when presented to him, and also catches them himself, when they are reposing in the evening, upon the walls of the room. I have seen him use his double tongue, however, when eating them. When he licks the hand, as he now does (being so tame) frequently, he produces a sensation as if of something very hard and rough rubbing against the skin, which, I think, is produced by the second tongue; though I am not perfectly certain whether it may not be his teeth. I have never seen it projected alone, however, but always in company with the other. His teeth, especially the canine ones, are exceedingly sharp.

These are the most remarkable particulars with regard to his external form.

His manners and habits are also sufficiently interesting. His food consists of fruit and small animals, as birds and mice. The plantain is the fruit of which he is the most fond, and was the only food I saw him eat when I first got him into my possession; but as this, or any other fruit of the kind, could not be had during a voyage of four or five months, I became anxious to know what other sort of fruit he would eat. Touching him rather incautiously soon after getting him, he very dextrously inserted his sharp canine teeth in my fingers, and with all the good will, too, of a creature accustomed to prey upon other animals in his native woods. Improving by such experience, and finding his teeth formed for tearing as well as masticating food, I offered him part of a recently killed fowl, of which he partook most eagerly: the necks of fresh-killed fowls, therefore, formed the major part of his food during the rest of the voyage. Small birds he is particularly fond of; these, when put into his cage, he kills speedily; and, plucking the feathers off with all the skill of a poulterer, soon lodges the carcass in his stomach. He eats the bones as well as the flesh; and though birds, and mice perhaps, are his favourite food, he eats other meat very readily, especially when quite fresh: if boiled, or otherwise cooked, he will not taste it. He prefers veal to all other kinds of butcher's meat; eggs, also, he is fond of, and sugar is especially grateful to his palate: he likewise eats gum-arabic. As flesh is not always to be had quite fresh (the only state in which it is acceptable to him), he has for some time past been fed upon bread sopped in water, and sprinkled with sugar; this he eats readily, and seems to relish it much. M. Vosmaer mentions that his animal eat dry biscuit, but refused it if moistened with water; neither would it ever taste water. This is completely at variance with the habits of my animal, for he not only eats moistened bread, but laps water like a cat. When food is presented to him, if hungry, he seizes it with both hands, and, letting go with his right, holds it with his left all the time he is eating. Frequently, when feeding, he grasps the bars in the upper part of his cage with his hind paws, and hangs inverted, appearing exceedingly intent upon the food he holds fast in the left hand. He is exceedingly fond of oranges; but when they are at all hard, he seems very much puzzled how to extract the juice. I have, upon such an occasion, seen him lie all his length upon his back, in the bottom of the cage, and, firmly grasping the piece of orange with both hands, squeeze the juice into his mouth.

The fæces are very peculiar, though they may, in a great measure, be influenced by his peculiar diet. They are very hard oval pellets, very much tapered at the extremity last discharged, and sometimes tapered off to a long thread, 2 or 3 in. in length. As he generally eats the bones of the animals, or necks of the fowls, he is supplied with, this may, perhaps, render his fæces harder. They are still, however, hardish, even when he is not allowed to eat bones. Figs, when given him, have a very laxative effect; but though his fæces are then soft, they do not lose their characteristic figure. He scatters his urine frequently when he moves about, leaving a train behind him. This he does almost as soon as he leaves his cage, rubbing, apparently, his tail upon the ground, as if to assist him in the act of expelling his urine. He has a very peculiar odour, sharp and pungent, especially when kept very warm. It is perhaps his urine that imparts this disagreeable smell.

He generally sits upon his hind part (the hair of which is much worn by long sitting), close to the bars of his cage, grasping them firmly with his hind paws; he then rolls himself up like a ball, with his head in his breast, his thighs closely placed over his belly, and his arms over his head, generally grasping the bars of the cage with his hands also. In this position, and also without moving, he remains the whole of the day. Upon coming into the Channel, the cold weather affected him very much; he was seized with cramp, and I at that time placed him in a small box, which was filled with very soft down. This he felt so agreeable, that, when cold, he never left it during the whole day, unless disturbed, and slept in it rolled up in the shape of a ball.

He is exceedingly slow in his motions, and his trivial name, tardígradus, well marks his habit in that particular. He is evidently formed for preying by night, and for climbing trees. When he climbs, he first lays holds of the branch with one of his hands, and then with the other. When he has obtained a firm hold with both hands, he moves one of his hind paws, and, after firmly grasping the branch with it, he moves the other. He never quits his hold with his hind paws till he has obtained a secure grasp with his hands. When he walks, he moves his limbs in the same methodical manner as when he climbs. It is not till night that his activity commences, and this particular shows the beautiful arrangement of Providence. With such slow motions, were he to prey during the day, there is almost no animal but would very easily escape him; he must, therefore, be awake during the night, and clamber the trees slowly and gently, to secure his prey, which I should think consisted chiefly of birds, when they are at roost. But though very much inclined to sleep almost the whole day, he does not seem so slothful as has been said by Vosmaer; though, perhaps, his habits may have been broken in upon by the treatment he met with on board the ship during his passage. Kept in an open part of the deck, surrounded by half the ship's company, and teased by the sailors in their idle moments, he has perhaps become more watchful, and more easily disturbed, than was the case with M. Vosmaer's; who says that, during the day, he could clean out his cage without even disturbing him. In this animal, a very slight touch of his cage or the box in which he sleeps is sufficient to arouse him, and he then observes all your motions with rather a jealous eye. He is very sensible to cold, and his thick fur coat was no doubt given him by his bountiful Creator as a protection against it. Incapable, from his slow habits and nature, of taking exercise violent enough to warm him during the winter, he is enveloped in this thick mantle, which renders him, in a great measure, independent of moving about; and, rolling himself up like a ball, in a sheltered situation on the branch of a tree, grasping it strongly with his hind paws, he passes any short season of cold in as comfortable a manner, no doubt, as it is possible for such a slow animal to do, till the returning season of heat brings him warmth and comfort again.

His temper, in cold weather especially, is very quick; but, in general, he is rather timid, and never offers any injury unless incautiously touched, teased, or provoked: he then makes a shrill plaintive cry, evidently expressive of much annoyance, and bites very sharply. This cry has been mentioned either by Vosmaer or Sir W. Jones, and described as resembling the sound *ai ai*, shrilly sounded, and repeated several times successively. When the cat annoys him, which she does very frequently, by leaping over him, he repeats the cry nearly a dozen times: it is always, however, expressive of anger. He has also another sort of cry, expressive of eagerness to obtain any thing: this is much gruffer in sound, not shrill nor loud, but apparently made by forcing the air out of his nostrils. He likes much to be stroked under the chin and throat, and also under the arms, turning his head round to the hand like a cat, and lifting his arm, stretching it out beyond his head. Though not a very sensible animal, he is still evidently capable of feeling kindness, and showing resentment. He allows his throat and fore arm to be stroked, but refuses to let the same liberty be taken with his hinder limbs. For some time, while in China, a little Chinese dog was his companion, sleeping in the same cage with him; and, with the exception of a few occasional jars, they lived very comfortably together. As the dog grew up, however, they were separated. A cat, the only animal in the house besides himself, has made many overtures to him, and, when he is allowed to get out of his cage, he is followed up and down the room by his feline companion, who evidently wishes to make him her playfellow. Any undue familiarities, however, on her part are met with an immediate repulse from him; and, one time, when patting him rather incautiously with her foot, he bit her so severely, that she now, though evidently wishing to be on good terms with him, keeps at a safe distance. This same cat has, since this, again become more familiar. Though not daring to approach him, she follows wherever he goes, to his great annoyance, and renders herself an object of his abhorrence. He cries out on her approach, and is sadly tantalised by her playful trick of leaping over him. He seems to be rather a social animal notwithstanding. A large japanned tray attracts a good deal of his attention. Seeing his image reflected in it, he walks before it, and tries to grasp his own image. Finding his efforts ineffectual, he imitates the action of the child, by peeping behind, with expectation to see the object there. Before a looking-glass he shows the same regard and curiosity.

Vosmaer classed this animal among the sloths; but a very superficial view of him is enough to show the erroneousness of this opinion. Buffon, though classing it where Linnæus has done, under the name of Lòris, has evidently mistaken the animal entirely. Never having seen it, he has confounded it with another species of the same genus. "Viewing its figure, and the length of its legs, he could not imagine that it was slow in leaping or running." This, however, is not correct; for he is incapable of leaping, and, from his motion and manner, it is evident he never does leap. When irritated, I have seen him dart his body forward to seize the offending object; but, in doing this, his general habits were clearly evinced, his body only being bent, while his hind feet held fast the perch on which he stood, and he made use of them only as a fulcrum, or purchase, to increase the celerity of his movement.

I could obtain no information from the natives who brought me this specimen, regarding his habits and economy: Sir W. Jones mentions that by the Indians he is called the *bashful ape;* but with regard to his history the natives were entirely ignorant. He is the second specimen I have seen of this species, which, I believe, has been rarely met with in this country before.

A very singular anatomical particularity, which in course I have not seen myself, was observed and pointed out by Sir A. Carlisle, who had a rare opportunity, some years ago, of dissecting an animal of this kind. The subclavian artery, soon after entering the axilla, divides into twenty-three equal-sized cylinders, which surround the principal trunk, now diminished into a very small vessel, accompanying each other in their course down the arm, and dividing along with the ulnar and radial arteries. The iliac artery, at the margin of the pelvis, divides into upwards of twenty equal-sized cylinders also, in the same manner as the subclavian. These cylinders, in their course, are distributed to the muscles, each muscle having a cylinder to itself; the trunks of the arteries distributing themselves to the other parts, as in other animals.

ART. III. *Notice of a remarkable Hare* (Lèpus tímidus L.), *caught at Dunfanaghy in Donegal.* By JOHN V. STEWART, Esq.

Sir,

THE hare, of which the accompanying sketch (*fig.* 84.) is a very correct representation, was caught by me in a snare,

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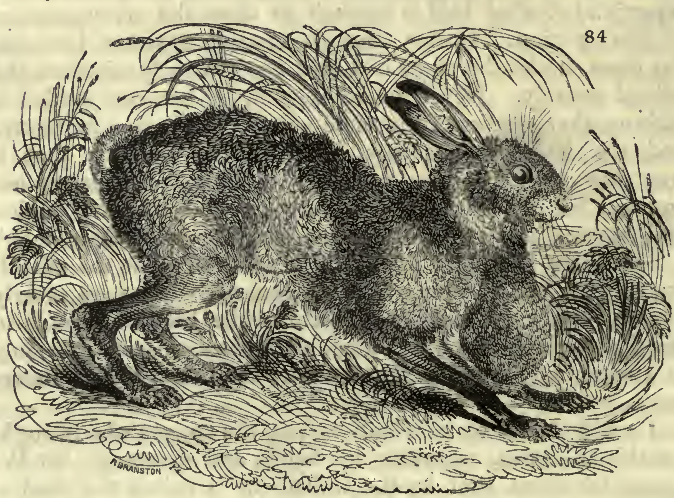

about three months ago; and, as I am making a collection of the beasts, birds, and insects indigenous to this country, and take a great interest in subjects connected with zoology, I have preserved it, and placed it in my museum. After I had removed the skin, previously to stuffing it, the lump, which is about the size of a hen's egg, remained attached to the throat and sides of the neck, by a membrane which, surrounding it, formed an internal bag within the skin. As this membranous covering, and the skin surrounding it, were kept distended at the top, by their connection with the sides of the neck, and at the bottom by the lump, it had the appearance, when the hare was standing, as if the lump extended all the length of the pocket; but, when the hare was in motion, or the lump was subjected to pressure with the hand immediately under the throat, it was evident that the lump was pendulous, and entirely confined to the lower part of the pouch. The pouch was rather more than 5 in. long, and about 7 in. in circumference, covered with fur similar in every respect to that on the throat. The lump, which was nourished by large blood-vessels, communicating with it from the neck, presented no appearance of disease; it resembled the other fleshy parts of the animal, and was not in the least degree callous. From these circumstances, several medical gentlemen to whom I have shown it since I preserved it in spirits, are induced to consider it as not cancerous; I am, however, myself disposed to think, though possessing no surgical knowledge, that it must originally have arisen from a diseased state of some of the glands, and that as the lump so produced increased in size, it became to a certain degree detached, and thus by its own weight produced the pouch which gives the hare this singular appearance. Had the animal been suffered to live, the pouch must soon have come in contact with the ground, and would probably in a short period have ulcerated, and terminated its life. It had every appearance of being an old hare; the body appeared to be in a very healthy state, and it would in a short time have had two young ones.

I have the honour to be, Sir, &c.

John V. Stewart.

Art. IV. *An Arrangement of the different Species of Falcons found in Great Britain.* By T. F.

Sir,

Some observations and slight omissions of your correspondent Z. B., under your article "Retrospective Criticism," (p. 94.), have induced me to offer, to such of your readers as may feel an interest in becoming acquainted with the number of falcons found in their native island, an arrangement of the genus Falco of Linnæus, divided into sections according to the system of modern naturalists, and accompanied with a few remarks; referring such as may wish for further information, to Temminck's *Manuel d'Ornithologie*, and Selby's *Illustrations of British Ornithology.*

Order RAPACIOUS (*Accípitres Linn.*).

Genus Falcon (Fálco *Linn.*)

Section I. *Falcons.*

This section contains the true falcons, being chiefly those which were made use of in falconry, and called long-winged hawks, from the closed wings reaching to, or almost to, the end of the tail.

1. Gerfalcon (Fálco islándicus *Lath.*). (*fig.* 85.) — This is one of the boldest birds of the whole genus, and was used in falconry for the larger species of game. Its native country is Iceland. The White Gerfalcon, Brown Gerfalcon, Iceland Falcon, and Greenland Falcon are considered synonymous. It rarely occurs in England.

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2. Peregrine Falcon (Fálco peregrìnus *Linn.*).—The Haggard Falcon, Barbary Falcon, Yearling Falcon, and Red Falcon are considered as only changed in plumage, as is also the Lanner of the *Brit. Zool.*; but the Lanner of Lath. and the *Arct. Zool.* is placed by Temminck as a distinct species, which is said to be found in Hungary and Russia, and has never been met with in England that I am aware of. The Common Falcon (Fálco commùnis) is also placed among the synonyms of the Peregrine.

3. Kestrel (Fálco *T*innúnculus *Linn*). — 4. Hobby (Fálco Subbùteo *Linn.*). — 5. Merlin (Fálco *Æ*̀salon *Linn.*). The Stone Falcon is doubtless only an old male, becoming bluish-grey above.

Section II. *Eagles.*

These birds are more powerful than the former, but not so rapid in flight.

1. Golden Eagle (Fálco Chrysàëtos *Linn.*). (*fig.* 86.)—The Black Eagle of Pennant, and the Ring-tailed Eagle (Fálco fúlvus) of other English authors, are clearly ascertained to be the young.

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2. Cinereous Eagle (Fálco Albicílla *Linn.*). — The Sea Eagle (Fálco Ossífragus) has been satisfactorily ascertained to be no other than the young; though it appears surprising, that a bird, which has been generally described as larger than the Cinereous, should now be pronounced the young of the latter. This teaches us how careful naturalists should be to take descriptions themselves, and not to copy merely what their predecessors have said, who perhaps have never seen the thing they attempt to describe. The Bald Eagle (Fálco leucocéphalus) is considered by some a variety of the Cinereous; but Temminck, I think, from his observations, is authorised in continuing them distinct. — 3. Osprey (Fálco *H*aliæ̀etus *Linn.*).

Section III. *Hawks.*

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The birds of this section are those in falconry called short-winged hawks, their closed wings being far distant from the tip of the tail.

1. Goshawk (Fálco *p*alumbàrius *Linn.*). (*fig.* 87.) — Your correspondent Z. B. has omitted this bird. It is very rare in England, but breeds in Scotland and the Orkneys. The Gentil Falcons of the *Brit. Zool.* are doubtless only the young of the Goshawk. It may here be well to observe, that modern ornithologists consider that there is no such bird as the Gentil Falcon, as a distinct species. The birds that have been described under that name appear to me to differ much, some being long-winged hawks, and others short. The former will be generally found to correspond with some state of plumage of the Peregrine, and the short-winged with that of the Goshawk. The term Gentil has caused confusion, from having been ap-

plied to any species that had been rendered gentle, and fit for the purpose of falconry.

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2. Sparrowhawk (Fálco *N*ìsus *Linn.*). — I should feel obliged by any of your correspondents informing me, through your Magazine, if they have ever seen a *female* Sparrowhawk, with a blue back, like that of the adult male. I have seen several, but never a blue-backed one, which makes me doubt its occurring, unless in very old birds.

Section IV. *Kites.*

1. Common Kite (Fálco *M*ílvus *Linn.*). (*fig.* 88.)

Section V. *Buzzards.*

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1. Common Buzzard (Fálco *B*ùteo *Linn.*). (*fig.* 89.)

2. Rough-legged Buzzard. (Fálco *L*agòpus *Linn.*).

3. Honey Buzzard (Fálco apívorus *Linn.*).

Section VI. *Harriers.*

1. Henharrier (Fálco cyàneus *Linn.*). (*fig.* 90.)

The Ringtail is now, beyond all doubt, ascertained to be the female, or young of the Henharrier.

90

2. Marsh Harrier, or Moor Buzzard (Fálco rùfus *Linn.*).

3. Ash-coloured Harrier (Fálco cineràceus *Montagu*).

As Selby rightly observes, we are indebted to the persevering researches of our countryman, Montagu, for the discovery of this new species of falcon, in whose *Ornithological Dictionary and Supplement* a full account may be found. It is to be hoped, that the public will be favoured with a new edition of that excellent work, which contains much practical information, but has been out of print several years. The correct work of Selby may be thought to supersede it, but as that does not give the dimensions, the size of a bird cannot be ascertained without his *Illustrations*, which are much too expensive to be generally obtained, and a dictionary of the provincial names is highly desirable. From the foregoing list, it appears we have seventeen species of falcons, and, I believe, no more, though others have been placed in our Fauna, such as the Spotted Falcon and Grey Falcon of the *Brit. Zool.*, which I have but little doubt are not distinct species; the latter being no other than a Gerfalcon, and the former a Gerfalcon or variety of the Common Buzzard, though Montagu, in his *Supplement*, seems to think the Spotted Falcon a distinct species. The great confusion among the falcons has arisen chiefly from the difference of plumage, which exists between the adults and young of several species, and from the various changes which they undergo in arriving at maturity; the complete dress not being attained in some till the fourth or fifth year, and even later. The term *noble* appears to me to have been applied, not to all such as take their prey in the air, which is the definition given by your correspondent Z. B., and who, in that case, I think, improperly excludes the eagles, which, according to Temminck and Montagu (see Montagu's *Supplement*, article *Eagle*, *Ring-tail*), pounce their prey on the wing, but to have been used to denote such as were used in falconry only, which was formerly the sport only of princes and *noble* persons.

London, *May*, 1828. T. F.

ART. V *Some Account of Francesco Redi's Experiments on the Generation of Insects.* By T. L. H.

Sir,

It is, I believe, well known, that, till the time of Redi (died in 1697, aged 70), equivocal generation was the subject of general belief. This celebrated Italian physician was the first to prove, by that infallible test, experiment, that insects were not engendered in putridity. The work in which he recounts his labours to do this, is in the form of a letter to the Signor Carlo Dati, and consists of a hundred and fourteen close octavo pages. It is true that in this space there is much matter irrelevant to the main subject, as he wanders to various observations on the nature and habits of bees, wasps, and one or two other insects; but the whole of it is well worth the study of any one who can give their attention to it, and who understands the language; for it has, I think, never been translated, however it may have been borrowed from.

After some moralising, and some expressions of his diffidence and intended accuracy, our author enters on his subject. He commences with some observations on the opinions of the ancients, which were somewhat as follows: — They believed that when the earth issued from the hands of its Maker, it immediately began clothing itself in a green down, similar to that on young birds, which, strengthened by the light of the sun, and the earth's own juices, gradually expanded into herbs and trees; these were intended to sustain the animals it afterwards produced. Not content with this, it aspired to become the acknowledged mother of man; and the Stoics affirm, that soon after men began to bud forth upon the face of the earth, as we now see mushrooms. Some, indeed, believed this to be confined to particular parts of the world, and the Ethiopians, Egyptians, and Phrygians, all claim this honour for their native countries. Besides these, the Arcadians, the Phœnicians, and Atticans boast of the same glory for their lands, but more particularly the Athenians, who, it is well known, wore a golden cicada in their hair, to denote that their forefathers sprang from the earth, as those insects are still supposed to do. Meantime, the earth, says Redi, *non ancora ben esperta in questo mestiere* *, as yet produced but imperfect animals; so that sometimes they were seen, this wanting a feature, that a limb, while others again presented a monstrous mixture of different beasts, or even of man and beast. But, still aspiring, she at length succeeded in producing perfect animals, and perfect men. The men were at first little worms, which, by degrees, assumed the human figure. At length, old and worn out, she became sterile; but although she no longer retained the power of generating men and other large animals, she was still able to bring forth insects and such small creatures, as well as plants, supposed to spring up spontaneously and without seed, which power she has ever since retained, and ever will. Some suppose this power of the earth to be innate, others that she was impregnated by the light of the sun, or its heat; and, in short, various other conjectures have exercised the imagination of philosophers.

* Not yet very expert in this business.

Another opinion was, that insects were generated by the collection of the fundamental atoms of the universe into small bodies. "But," says our author, "that great philosopher of our times, William Arveo, is of opinion that all creatures come from the seed, either of their own species, or of any other animal, indifferently; or are propagated by generative atoms, which float about in the air; but whence, or how, these atoms have their origin, he does not say. Among the various opinions of past philosophers, cited by Redi, the following is too curious to be omitted, though, if I noticed all, it would prolong this article to a tedious and unnecessary length. I mean that of Kircher, respecting the propagation of snakes. "Take some snakes," says that author, in the twelfth book of his *Subterranean World*, "of whatever kind you want, roast them, and cut them in small pieces, and sow those pieces in an oleaginous soil; then, from day to day, bathe them lightly with water, from a watering-pot, taking care that the piece of ground be exposed to the spring sun, and in eight days you will see the earth strewn with little worms, which, nourished with milk mixed with the water, will gradually increase in size till they take the form of perfect serpents. This," adds he, "I learned from the carcass of a serpent, which I found in the country; it was covered with worms, some small, others larger, and others again that had evidently taken the form of serpents. And what renders it still more marvellous, is, that among these little snakes, and mixed as it were with them, there were certain flies which I should take to be engendered in that substance, which constituted the aliment of the snakes." "Thus far Kircher," says Redi; "and I, moved by the authentic testimony of this most learned writer, have often made the trial; but I never could witness the generation of these blessed little snakes made to hand."

Wishing to sift the truth of these opinions by personal observation, he had three snakes, which he calls Angui d'Esculapio, killed, and put into an open box. These were soon covered with little worms, all alike in shape, being conical, but of different sizes, as they were produced at different times, which increased daily both in size and number. Having consumed the flesh, they all escaped through the fissures of the box, leaving the naked bones in a corner. He again had three of these snakes killed, and put them into a box as before; in a few days they were peopled with worms, of the same shape as the former; but some, less than the rest, were inclined to flesh colour, while the others were entirely white. Having devoured the snakes, they anxiously sought to escape; but as he had taken more care than before in securing all the outlets in the box, they were unable to effect this. Gradually they became more quiet, and, after some time, lay motionless, as if asleep. Shrinking into themselves, they imperceptibly took the form of an egg, and, by the twentieth day, they had all assumed this figure. At first they were of a white colour, but by slow degrees became first golden, then red. Some remained of this colour, but the rest continued to become darker and darker, till they were quite black; and, from soft and tender, their skin had changed to the hard and brittle shell of the chrysalis or aurelia. On examining these more closely, he found the black ones were more strongly marked than the others, which were nearly smooth. At the end of eight days the red chrysalides burst, and from each issued a fly of a dull ash colour, "turbid, dismayed, and, so to speak, wrinkled and unfinished," with its wings yet unfolded; but, in the space of a quarter of an hour, it dilated its little body, unfolded its wings, "and, relinquishing the sad ash colour, it was dressed in a vivid green, marvellously brilliant. It was now so much larger than before, that it seemed impossible to conceive that its little shell could have contained it." In fourteen days some of the black ones burst, and produced a larger fly, "black, marked with white, hairy on the abdomen, and red at the nether end; such as daily frequent butchers' shops, or any place where there is dead flesh. At first they were like the others, slow, slovenly, and sluggish in their appearance." In seven days after, the rest of the chrysalides burst, and liberated certain little black flies, smaller and brisker than both the other kinds, which Redi says he believes to have been undescribed by any former naturalists. It would be a useless task to pretend to ascertain the exact flies Redi speaks of, as, notwithstanding his vivid descriptions of their beauty, his terms are too general to afford any assistance in the enquiry. Our main point is to state how he attained his grand object, without entering into minute and unnecessary details.

So many different flies from the same kind of flesh, did not dismay, but, on the contrary, stimulated him to fresh exertions; instead, therefore, of only one kind, he put many into different boxes, and obtained the same result as before, except that the different species of insects were more numerous. He next put some skinned river frogs into a glass vessel, which he left open; on the following day, he found them covered with worms, some sporting in the fetid liquor that had stilled from the carcass, while the rest depastured on the frogs. On the third day he found they had all decamped, leaving nought of the frogs but the bones. Some fish from the Arno were the next victims to his inquisitive spirit, and these also were soon peopled; but on these, and the sides of the box in which they were placed, he observed not only worms, but also some very small eggs, which, crushed between the nails, gave a white subtle liquid, clearer and less viscous than the white of birds' eggs. By the twentieth day they were all hatched, and the worms had increased to twice their original size, and went about twenty-five or thirty to the grain; but, next day, they were so amazingly enlarged, as to weigh about 7 grains each. Meanwhile, they continued devouring the fish, and, finally, left nothing but the bones; and these "they left as white and clean as if they had issued from the hands of the most diligent anatomist in Europe." Having taken means to prevent their flight, which they all attempted, he watched their gradual progress towards perfection. The perfect insects were of five kinds; four he had seen before, the fifth, a little black fly, greatly exceeding the number of its pupæ, which were black and large, he had never observed till then. Seeing this curious disproportion, he opened one or two of the pupæ, and found that they contained, upon an average, from twenty-five to thirty flies, but never more than forty. After this, he made many more experiments on lion's flesh, tiger's, and, in fact, *multitudinous* species of fish, flesh, and fowl, cooked and raw, and found that the insects were promiscuously produced on all kinds of meat; and, indeed, one piece would sometimes contain all the species he had observed, and he generally observed not only worms but eggs. The eggs reminded him of the impurities left upon meats by flies (that afterwards become worms), which butchers and housewives guarded against by defending them with gauze coverings.

This made him doubt whether the eggs he had perceived were not deposited on the meat, by flies similar to those they produced, instead of being generated by the corruption; the more, because he invariably found that flies, resembling those afterwards produced from their eggs, alighted upon the flesh previously to the appearance of the worms; "but vain would have been the doubt, if experience had not proved this." To do so, he put into four wide-necked flasks, a snake, some river fish, some eels from the Arno, and some veal, and covered the mouths with paper, tied on tight, and sealed. As many more flasks, containing similar meats, he left open. In a few days, the fishes and meat in the open flasks were, as usual, covered with worms; in the closed flasks, the flesh, although putrid, was entirely free from worms, though, on the outside of the paper, there were a few worms as well as eggs; the former, in vain, using every endeavour to enter. After this, he made many similar experiments, and always found that uncovered meats shortly teemed with life; while, on the contrary, those that had no communication with the external air, corrupted, but never verminated. During the course of these experiments, he ascertained the curious fact, that when the common fly dies, it serves as a nest for its own species equally with any other kind of dead flesh. Not yet satisfied, he determined on making a new experiment. He put some meat and fish into a large vessel, covered with very fine gauze, which he also put into a large box, covered with the same gauze, that the air might penetrate to the meats, while it remained free from the intrusion of insects. On these he did not see a single worm, but frequently saw the little creatures writhing about on the outer gauze, trying to make their way through; and it was with difficulty that he was once quick enough to prevent two of them from falling on the meat, for they had got their bodies half through the inner gauze. He also observed the flies, attracted by the meat, and unable to make their way to it, drop their eggs upon the gauze; some of them alighting upon it, others hovering in the air during the operation; and he perceived that each left six or seven eggs at a time. This was the point he wished to attain, and he had now discovered that insects supposed to be engendered by corruption, were, in reality, propagated by their own species.

Notwithstanding his liberal philosophy, and his active experimenting, Redi falls into the most extraordinary error; he asserts that some plants, fruits, &c., produce insects. That one who went so far should go no farther, but cease his experiments just where he ought to have pursued them still more zealously, appears incomprehensible; it would seem that he had purposely left to others the glory of finishing what he had so nearly accomplished. It is the more marvellous, as in one particular instance he was so near the truth. Let me use his own words. Speaking of the galls in oaks, he says, "I freely confess, that having made my first experiments on the generation of insects, I was inclined to believe, or rather suspect, that perhaps the gall was caused by an insect, which, coming in the spring, and making a little fissure in the tenderest branches of oaks, secreted an egg in that fissure, which was the cause of the excrescence, ... and I was inclined to think that the gall was a disease, occasioned by the puncture of the fly, ... as we see tumours arise on the human body, from the same cause." After various doubts, he says, "It seems more probable that the generation of insects born in trees, should not be chance generations, nor caused by any fly depositing its egg there, as *each gall has its particular insect*, a rule without an exception;" but that it should be produced by the tree itself. It did not strike him, that the "particular insects" might cause the peculiarities of the gall, nor that the "particular insects" might choose particular trees in which to deposit their eggs. The insects found in fruits, he also supposes to be generated by virtue of the tree itself, and without any pre-communication with the perfect insect. In support of this doctrine he supposes trees to be endowed with sensation, and brings many revered names to assist him in his need, among whom he cites Aristotle, Plato, and Pythagoras.

T. L. H.

Art. VI. *Some Account of the Hessian Fly.* By the Reverend William Kirby, M.A. F.R. and L.S.

Sir,

No departments of natural history are more generally interesting than those which connect it with agriculture. I need not, therefore, apologise for making known to the public, through the medium of your useful Magazine, the name and characters of an insect, which, under the appellation of the Hessian fly, has done as much damage to the crops of wheat in North America, and created as much alarm in this country, lest it should be imported, as any depredator of its class ever did.* Having been long anxious to ascertain what the insect was, that had attained to such celebrity for the injuries it was the author of, I applied to a friend connected with America to give what information he could procure, but without success; till, very recently, I met with a paper of Mr. Say's upon this very subject, inserted in the *Journal of the Academy of Natural Sciences of Philadelphia* for the year 1817.

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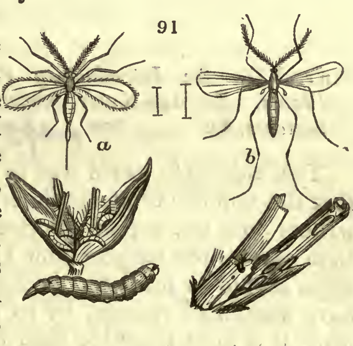

I had, in the *Linnean Transactions*, long ago, under the name of *Típula trítici* (*fig.* 91. *a*), given an account of a little orange-coloured gnat, which I conceived to be injurious to the wheat crops of this country, by causing the inanition of the grain wherever it laid an egg †, which was within the glumes of the florets. This gnat, in the modern system, belongs

* See Introduction to Entomology, first edition, p. 52. 168.
† Linn. Trans., iii. 242—245. iv. 224—230. v. 96—110.

to the genus Cecidomẙia, though it does not, like the other species, produce galls in the plants it infests. To this same genus the Hessian fly, according to Mr. Say, also belongs, and he names it Cecidomẙia destrúctor (*b*).

The antennæ of the male are shorter than the body, somewhat slenderer towards the tip, with hairs in whorls, moniliform, with the joints connected by a transparent thread. The head and thorax are black; breast sometimes fulvous; wings black, fulvous at the base, fringed, longer than the abdomen; legs pale, covered with black hairs; abdomen brownish. In the female, the joints of the antennæ are not connected by a transparent thread, and the abdomen is fulvous, with a dorsal and ventral black interrupted vitta.

A species of Céraphron (C. destrúctor) deposits its eggs in the larva, and keeps this destructive little pest within due limits, otherwise Mr. Say supposes that the crops of wheat would be totally annihilated. The female deposits from one to eight or more eggs upon a single plant of wheat, between the vagina of the inner leaf and the culm nearest the roots; in which situation, with its head towards the root or first joint, the young larva passes the winter. They eat the stem, which thus becomes weak, and breaks.

This species, and C. *trítici* above mentioned, from their causing no galls, appear to form a distinct group in the genus Cecidomẙia, with which, however, they agree in the characters assigned to it by Meigen.

As few entomologists appear to have been aware of the above discovery of Mr. Say's, I hope this short account of it will not be unacceptable to your readers.

I am, Sir, yours, &c.

WM. KIRBY.

ART. VII. *An Introductory View of the Linnean System of Plants.* By Miss KENT, Authoress of *Flòra Doméstica, Sylvan Sketches,* &c. — K refs

THE vegetable world was so little known in ancient times, that the number of plants described by the Greek and Roman writers does not exceed fourteen hundred; less than a thirtieth part of the number now known. Some allowance, perhaps, should be made for the fact, that some modern botanists have multiplied species, by so denominating mere varieties; while it is most probable that, in ancient times, many distinct species were confounded together. Still the number of plants known to those early writers must have been very small; and even that small number were very imperfectly understood. They had not, as we now have, a language by which every botanist is clearly intelligible to another; the description of one plant was very frequently applicable to many others; and, at this distance of time, it is, in many instances, impossible to ascertain what were the plants intended. Hence have arisen conjectures without end, upon questions which can never be determined. Thus, the ancient hyacinth is, by some, supposed to have been the Eastern flower which now bears that name; by others, on account of certain figures on the petals, it is believed to have been what we now term the martagon lily; and many think it was the larkspur. The mallow, so important as an esculent vegetable, and mentioned as such by Horace, and in the Old Testament, is now unknown. Most probably we have the plant, but are unable positively to identify it; and it is the same with many others.

It was not till towards the end of the sixteenth century, that botany was reduced to any sort of system. The first systematic arrangement of vegetables was published by Cæsalpinus, an Italian physician, in the year 1583. Many others succeeded, which, however ingenious, were of little public utility, because no one was generally adopted; until the admirable system of Linnæus, towards the middle of the eighteenth century, prevailed over all others, and was universally approved and followed.

There is at present, however, a sort of rivalry between the system of Linnæus and what is termed the natural method of Jussieu. The heart-burnings of rivalry and party spirit should not be suffered to approach the — may we say — *amiable* science of botany. Linnæus himself was earnest for a natural arrangement, and was well aware of its importance. He left what he called a fragment of a natural method, which he recommended succeeding botanists to perfect; not as a successor, but as a companion, to his own beautiful system. It has been well observed by Mr. Bicheno, that "the two great masters of botanical science propose different ends, and ought not to be regarded as rivals." The artificial system of Linnæus enables us to become acquainted with individuals; and, for this purpose, the object is to divide and to define: the natural method of Jussieu looks to their connections and affinities; consequently its object is diametrically opposite to the former, and its business is combination. For a precise knowledge of the different species of plants, the system of Linnæus is unrivalled; and it is only by an accurate knowledge of the species, that we can avail ourselves of their various properties. Let us not undervalue the labours of Jussieu; an accomplished botanist should be acquainted with both these systems; but we would recommend the young student to commence with the Linnean, as being at once the easiest in practice, and the least to be dispensed with.

When we say that Linnæus divided the vegetable kingdom into twenty-four classes, each of which classes is again divided into several orders, these subdivided into genera, and the genera into species, let it not be supposed that all these various terms and subdivisions increase the difficulty to the young student, for the truth is diametrically the reverse. Let the reader suppose that he has a plant before him, of which he would learn the history. He must first ascertain its name. Among nearly 50,000 plants he has to seek this one. It will readily be seen that if he has to plunge into the midst of all these numbers, and to compare the plant before him with the full description of each individual species, until he meets with one corresponding to it, it will be a task demanding a large portion both of time and patience, and he will be fortunate if his plant be not entirely withered and decomposed, before he have accomplished the work. Let him, then, suppose that, by observing one or two particular characters, he ascertains that it belongs to a class, containing about two thousand plants; that, by another glance, he understands it to be of an order of that class, containing two hundred; his task is now considerably reduced, but by a little further observation, he yet diminishes the number much more, before he has recourse to the full descriptions of the plants. The order to which it belongs is arranged in several divisions, according to some conspicuous characters; by attention to these, the number is reduced to forty or fifty. By a little closer inspection, he assigns it to the proper genus; and now, instead of comparing it with the detailed description of 50,000 plants, he has but six, a dozen, or perhaps twenty, to examine. In many cases, he may ascertain the particular species, without having occasion to go through the full description of any one but that which actually belongs to it. What would have been a tedious task, is thus converted into an interesting occupation, and he is surprised to find how easy is that which he imagined to be so difficult. The difficulties have been met, and overcome, by those who have given them the station and the name that rightfully belong to them. It is this which displays the skill of the botanist; and to do this, if necessary, it should be the ambition of the student to qualify himself.

The Linnean system is founded upon the parts of fructification, of which there are usually reckoned seven; the calyx, the corolla, the pistil, the stamen, the pericarp, the seed, and the receptacle. From one or more of these parts the class is formed; from others, the order and the genus. The species is determined by the other parts of the plant; the root, stem, leaves, &c.

The word *calyx* is of Greek origin, and signifies a cover; it is used to express the leaf, or leaves, usually growing immediately under the flower, and enclosing it while in bud. Its office is to protect the tenderer parts, and more particularly such as are essential to the production of fruit. It varies in situation, and yet more in form; and, according to these variations, is differently named, though the word calyx applies to them all. The most common of all its varieties is the perianth, so called from two Greek words, signifying around the flower. Its colour is most commonly, but not invariably, green.

Corolla is the diminutive of the Latin word *corona*, a crown, and is applied to that part commonly termed the flower, often so beautifully coloured, and more, perhaps, than any other part of a plant, subject to the dominion of Fancy. It would seem as though Nature had given the corolla more particularly in charge of this playful goddess. It is generally believed that the corolla, like the calyx, is intended as a protection to the internal parts of the flower; but this is like giving one infant to the care of another. The corolla is almost always of a delicate texture, in many cases so frail that a breath will destroy or dismiss it from its station; it is itself in need of protection, and, most commonly, very unfit to bestow it. This lovely portion of the flower has many uses more consistent with its delicacy, than that of life-guardsman. It were enough were it destined only to give pleasure; and, not to speak of the many chemical and medical uses, it frequently lodges fragrant oils, which, scattering volatile particles in the air, perfume the atmosphere around, and afford an additional pleasure to those who come to gaze upon its beauty. The corolla is sometimes composed of one piece, sometimes of several pieces; these are named petals, from a Greek word signifying to expand; and, according to their number, it is styled monopetalous, one-petaled; dipetalous, two-petaled; tripetalous, three-petaled; tetrapetalous, four-petaled; pentapetalous, five-petaled; or polypetalous, many-petaled. (*fig.* 92. *a*, monopetalous corolla; *b*, the perianth.)

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Old authors used the word leaves as well to express the divisions of the corolla and calyx, as the leaves commonly so called. Misled by this confusion of terms, Addison, who was probably unacquainted with the flower described by Virgil, represents the Italian aster (*A'*ster *A*méllus) as a purple bush, with yellow flowers, instead of telling us that the flower had a yellow disk and purple rays.

> " Aureus ipse; sed in foliis, quæ plurima circum
> Funduntur, violæ sublucet purpura nigræ."
>
> VIRGIL, *Georgic* 4.

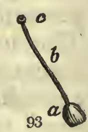
> " The flower itself is of a golden hue,
> The leaves inclining to a darker blue;
> The leaves shoot thick about the root, and grow
> Into a bush, and shade the turf below."
>
> ADDISON.

Dryden falls into the same error: —

> " A flower there is that grows in meadow ground,
> Amellus called, and easy to be found;
> For from one root the rising stem bestows
> A wood of leaves and violet-purple boughs.
> The flower itself is glorious to behold,
> And shines on altars like refulgent gold."

We doubt whether the plant would very easily be found by this description, or any plant that should correspond with it. Still further to avoid any confusion of this sort, by using terms as distinct as possible, some modern botanists have substituted the word sepal for the leaves of the calyx, from *sepire*, to surround or hedge in.

The *pistil* (*fig.* 93.) usually occupies the centre of the flower. It is composed of three parts: 1. the germen (*a*), which is the rudiment of the fruit; 2. the style (*b*), a tubular column proceeding from the germen; and 3. the stigma (*c*), or summit, which crowns the style.



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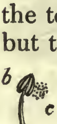
The stigma is, more or less, covered with a glutinous moisture: it varies considerably in form; and that which is called the simple stigma, having no form to distinguish it from the top of the style, might conveniently be called the summit; but the two words are generally used indiscriminately.



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The *stamen*, also, (*fig.* 94.) is composed of three parts: 1. the filament, or thread (*a*), which is affixed to some part of the flower, mostly to the corolla, calyx, or receptacle; 2. the anther (*b*), which is supported by the filament, and is a little bag, or case, containing the third part, which is called the pollen (*c*). This last is apparently a fine meal; but, when seen through a microscope, every particle appears a little bag, containing a meal yet finer. As the pollen ripens, it swells the anthers, which at last open, and shed it upon the stigma. It adheres to that part by the glutinous moisture before mentioned, and, by means of the hollow style which connects it with the germen, feeds the young fruit until it has attained its full growth. Thus sits the style upon the seeds, like the hen bird upon her eggs; while the stamen, like a tender mate, supplies her with food.

The pistil and stamen are the most essential parts of a flower, since, without them, no fruit can be produced. The corolla or the calyx may be wanting, and yet the flower will be termed perfect, because the absence of those parts is no obstacle to reproduction. Even the style and the filament may be absent, without preventing the formation or ripening of the fruit; and there are many flowers which have the stamen sitting close to the corolla, &c., without a filament, and the stigma to the germen without a style; but the anther, the germen, and the stigma are essential.

The *seed* is contained in the pericarp, or seed-vessel, which is the germen (before described as a part of the pistil) when grown to maturity. The name of the seed-vessel varies according to its form, substance, &c.; but the word *pericarp* a word of Greek origin, which signifies around the seed, is applicable to all its varieties.

The *receptacle* is the base, or medium, which connects the other parts of the fructification.

Of the varieties of all these parts I shall say more hereafter.

Of the twenty-four classes into which the vegetable kingdom is divided, the first ten rest solely on the number of stamens contained in their flowers; and proceed without interruption, the number of the class corresponding with that of the stamens. They are distinguished by the Greek numbers prefixed to the word *andria*, which is also of Greek origin, and signifies a husband, the stamen being considered the father of the fruit; while the pistil, which nourishes it in her bosom, being looked upon as the mother, is expressed by the word *gynia*, meaning a wife. By the number of the latter, the orders of these classes are distinguished. Thus, the first class, Monándria, is divided into two orders, Monogýnia and Digýnia; in other words, those flowers which have but one stamen are divided into two sets; those which have one pistil (*fig.* 95. *a*), and those which have two (*b*); we should rather say styles, for

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it frequently happens that they are multiplied, while the germ remains single. It is, therefore, from the styles, at their base, that the number is reckoned, or, where the style is wanting, from the stigmas.

Of the class Monándria, this country furnishes examples of four genera in the first order, and one in the second. These are all marsh plants, and chiefly affecting the sea coast; they are neither among the handsomest nor the most valuable of our native plants. One or two species are, I believe, of some chemical importance; and, from some foreign genera of this class, we obtain ginger, cardamoms, turmeric, arrow-root *, and, as the catalogue informs us, (and the reader will be surprised to hear it,) opera girls! (Mantísia saltatòria) from the East Indies. If the reader have any doubt of the fact, let him proceed forthwith to the botanic garden at Cambridge, where he may see a specimen of each; if, indeed, the saltatory tendencies of the latter have admitted of its remaining stationary for any length of time. It must be acknowledged that some of our English names are such as might startle a foreigner. Thus we furnish our gardens and green-houses with Old Mens' Heads and Lady's Fingers, Cats' Tails and Dogs' Tongues, Infernal Figs and Indian Gods. Our gardeners are, however, more considerate than might be supposed. If they grow Naked Ladies, they also grow Lady's Smocks, Lady's Mantles, Lady's Slippers, and Blue Bonnets; nor do they forget to provide Lady's Combs, and a crop of Looking-glasses. If they have the Tooth-ache tree, they also cultivate Patience; though they have Double Tongues, they are well supplied with Honesty to counteract them. In opposition to the Melancholy tree, they exhibit True Love, Heart's Ease, and Traveller's Joy; and though they deny not their London Pride, they are very careful to preserve the Humble Plant as an example.

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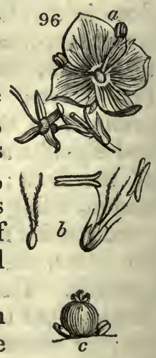

The second class, Diándria, is divided into three orders; Monogýnia (*fig.* 96. *a*), Digýnia (*b*), Trigýnia (*c*); one, two, and three styled. It is to be observed that, in the first twenty classes, the presence of the pistil is essential; if that is wanting, the plant must belong to one or other of the latter classes, as will be more fully explained in its proper place.

The first order of the second class contains ten British genera (that is, ten genera, of which some

* So named from the Indians using its juice as a remedy for wounds inflicted by poisoned arrows. It is also considered an excellent remedy for the stings of venomous insects, so prevalent in hot climates.

of the species are British); of the second order we have but one genus; and of the third, not any example.

To the first order belong the ash tree, and that beautiful spear-leaved * shrub called the Privet (*fig.* 97.), bearing thyrses of white flowers in the summer, and bitter black berries in the winter. One of the prettiest of the flowers that

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"Do paint the meadows with delight,"

in the months of May and June, is a species of *Verónica*, another genus of this order, supposed to derive its name from the saint so called. This plant, commonly called the Germander Speedwell, grows plentifully in hedges, meadows, &c.; and, as it will bear removal when in flower, if carefully uprooted, may be transferred to a garden-pot, and admired at leisure. Another genus of the ten afore-mentioned is the *Circæ'a*, or Enchanter's Nightshade, named from the enchantress Circe, and formerly believed to be a preservative against every species of magical incantation; alike defying the power of sorcerers, witches, demons, and evil spirits, of every denomination. One of the species is common in moist and shady situations; and, to say nothing of the extraordinary virtues attributed to it, is well worth seeking for its delicate and elegant appearance; the stem and leaves are frequently tinged, more or less, with a bright red, contrasting beautifully with the two little white, or pale rose-tinged, petals.

Among foreigners of the same class and order, we may reckon some of our most popular favourites; as the jasmines and the lilac trees; the snowdrop tree, now become a general tenant of the English shrubbery; rosemary, which, though not a native, has been found, for many years past, in every village garden; sage, familiar to us all from its culinary uses; and the olive, the tree presented to the city of Athens by the goddess of wisdom, and considered, not only as the emblem, but the maker, of peace, since it has been asserted that a few drops of its oil will calm the turbulent ocean itself. Even the rapacity of the plague may be checked, it is said, by anointing the body with olive oil, which secures it from the infection of that fierce disease, as well as of the yellow fever. It is also reputed as a

* Botanically termed lanceolate; shaped like a lance or spear.

cure for the venomous bite of the viper; and is a powerful antidote to various poisons. Nor let us forget the fruit itself, which, in its preserved state, is brought to table; not only to make a part of the dessert; not only, (as some suppose), to be eaten, or to heighten the flavour of wine; but also to introduce that never-failing observation, that a taste for olives is always an acquired one. Notwithstanding my own personal experience, however, I must venture to doubt this axiom, having seen a whole family of children, and even infants in arms, eat them as readily as though they had been sweet plums.

To look back, for a moment, to the jasmine. It is well known that the Italians obtain a perfume from its flowers, by a very easy process: soaking a quantity of cotton wool in some scentless oil, they put it into glass vessels, in alternate layers with the jasmine flowers; and, after a few days, squeeze the oil from the wool, and put it into bottles for use; the perfume being communicated by that simple means. But it would seem that the Italians derive little gratification from this result; for we are told that they (the Romans, at least) have a perfect abhorrence of perfumes; and avoid a person scented with attar of roses, with every appearance of disgust. Sir James Edward Smith, in his *Continental Tour*, speaking of the Borghese chapel at Rome, says that one of the popes having dreamed, in the month of August, of a fall of snow, and finding that it actually had fallen at that season, on a certain hill, built a chapel on the spot; and, in commemoration of the dream, on the anniversary of the day, caused an artificial snow to be showered upon the congregation there assembled, during the whole of the service. This artificial snow was composed of the beautiful and fragrant flowers of the white jasmine; and (can we believe it?) the ladies abstained from visiting the chapel on that occasion, from their horror of this sweet perfume.

The third order of the class Diándria supplies us with pepper, no unimportant article of trade. In some years, above six million pounds' weight of the berries of the *P*iper nìgrum (black pepper) have been sold at the East India Company's sales; of which, seven or eight hundred thousand have been retained for home consumption.

The third class, Triándria, also comprises three orders; Monogýnia, Digýnia, and Trigýnia. Of the first are many very handsome genera, chiefly bulbous-rooted; the *C*ròcus, *I*ris, *I'*xia, Mor*æ̀a*, *G*ladìolus, Antholỳza, &c. &c.; but the most interesting plant of this order is the *C*ypèrus *P*apỳrus *L.* (or *P*apỳrus antiquòrum *Willd.*), the celebrated Egyptian plant which furnished the scholars of antiquity with writing-paper.

The second order of the class Triándria is rich in invaluable productions. The plants of this order are not remarkably handsome; but they are to mankind, to Europeans, at least, the very "staff of life." It is chiefly composed of the grasses, of which there are many of incalculable utility, not only to mankind but to beast-kind; but the greatest treasure of its wealth is corn. Wheat, rye, oats, and barley, all belong to this order. The grasses are very numerous; and, from the smallness of their parts, and other causes, are, in many instances, rather difficult to distinguish, but they are well worth all the time and attention they demand. In a space not larger than a grain of rice, we may distinguish six or seven florets enclosed by a two-leaved calyx: each floret composed of a corolla in two parts; of three filaments, with anthers rather large in proportion with the other parts; and the germ, with its two styles and stigmas. Yet, notwithstanding their diminutive size (frequently not distinguishable without a magnifier), these stigmas are often finely feathered with compound feathers, as beautifully formed, and complete in every respect, as it is possible for any feather to be. The elegance of form, and delicate combinations of colour, are, in many species, truly admirable. Among them may be instanced one of the commonest and most generally known of all the grasses, the rye-grass (*L*òlium perénne). The meadow soft-grass (*H*ólcus lanàtus) has beautiful downy leaves, like velvet to the touch, with a compound spike of flowers, delicately variegated with pink and pale green. Another of this genus, *H.* arenàceus, is both elegant and majestic. I have seen this grass 6 ft. high, with leaves 2 ft. long, and more than 1 in. wide; with its panicle of flowers gently drooping to one side, at least 1 ft. 6 in. in length, and so finely polished, that, but for their green colour, we might think it was composed of silver oats. Yet it is *not* green; neither is it white, nor gold-colour, nor purple, but it is a union of all these: it is the offspring of silver and of gold, of the amethyst and the emerald. It is, indeed, very variable; but, in the full pride of its beauty, this grass is truly magnificent. The light purple pyramids that quiver in every field and meadow, must be well known to every reader. In fine, the student who has leisure to investigate their beauties, will find the family of grasses peculiarly interesting, and much more various and beautiful than, from the apparent homeliness of many, they might be supposed to be. Our gratitude is yet further claimed by this class and order, for its production of the sugar-cane, a plant which many persons will value no less than wheat itself.

Having furnished so many handsome plants in the first order, and useful ones in the second, the class Triándria seeks repose. The third order is small, and contains nothing particularly handsome, useful, or interesting. Here, then, reader, let us also repose; for we have not room to go through another class. So, gentle reader,

Au-revoir, — Adieu!

Art. VIII. *The Jussieuean, or Natural, System of Plants.*

(*Continued from* p. 144.)

[We have already noticed the importance of Crucíferæ to mankind, and the singularity of its botanical characters. In the general view which we are now giving of the groups into which plants are thrown by the natural system, we do not stop to render familiar to the learner the singular characters alluded to; because we know that we cannot do this with proper effect, till he has made himself master of the details which will be given by Miss Kent, in illustration of the Linnean system. By the time that we have got through our general view of the groups of plants, Miss Kent will be considerably advanced in her illustrations, and the student will then know enough of vegetable anatomy to follow us through scientific definitions of the different orders and tribes, and which definitions we intend to accompany by figures of the types of all the genera.]

The whole order of Crucíferæ is preeminently European; 166 species are found in the north and middle of Europe, and 178 on the sea-shores of the Mediterranean; 45 are found between Mogadore and Alexandria; 184 in the countries of the East, that is to say, Syria, Asia Minor, Tauria, and Persia; 99 in Siberia; 35 in China, Japan, and India; 16 in New Holland and the South Sea islands; 6 in the Mauritius and adjacent countries; 70 at the Cape; 9 in the Canaries; 2 in Saint Helena; 2 in the West Indies; 41 in South America; 48 in North America; 5 in Kamtchatka and the bordering islands; and finally, 35 are common to several parts of the globe. From this it appears that there are about 100 species in the southern hemisphere, and about 800 in the northern: or, if they are considered with reference to the zones of temperature, 205 are natives of the frigid zone of the northern hemisphere; 30 of the whole of the tropics; 548 of the temperate zone of the northern hemisphere; and 86 of the southern. The forty-first degree of north latitude may be considered the equatorial line of Crucíferæ, about half being found on one side of it, and half on the other. Their station is very variable; many inhabit open sandy places, some form the vegetation about the limits of the perpetual snows of lofty mountains, and many follow the footsteps of man through all parts of the world.

The useful qualities of the turnip, the radish, the rape, and the cabbage, and its multiform varieties, are all well known. The greater part of the order consists of plants possessing high antiscorbutic powers. These appear to depend upon a certain acrid volatile oily principle, the chemical nature of which is imperfectly known. It is particularly abundant in the seeds of mustard, the roots of horseradish, and the leaves of *Lepídium latifòlium*, which last exercise a violent influence upon the organs of digestion. The same sort of acrimony, but in less degree, is found in the herbage of the scurvygrass and the roots of the radish, which act much more mildly when taken inwardly; thus, when any cruciferous plants are found to be eatable, either from culture or other circumstances, it is to be understood to depend upon a reduction of this acrid principle. The exciting powers of this principle are what render the horseradish, the scurvygrass, and others, so remarkably useful as antiscorbutics. Plants of this order are also believed to possess diuretic and diaphoretic properties. It is to be remarked that Crucíferæ are always eatable when their texture is succulent and watery, as in the roots of the radish and turnip, and in the leaves of the cabbage tribe. A further diminution of the acrid principle is produced by blanching. Crucíferæ are said to possess a greater share of azote than any other tribe of plants; as is apparent in their fetid smell when fermented. The embryos of all the order abound in oil, whence many species are employed with much advantage for expressing, either for the table or for feeding lamps. Some of the species are extremely beautiful and fragrant, as the stocks, the gillyflowers, the hesperides, the candytufts, and many others. The hutchinsias, drabas, cardamines, &c., are among the most interesting of alpine plants.

Suborder I. *PLEURORHI'ZÆ.* o =

Tribe 1. *A*rabi'deæ.

Mathìol*a* R. Br.	Barbar*ēa* R. Br.	Macropòdium *R. Br.*
Cheiránthus *L.*	Bràya Stern.	Cardámine *L.*
*N*astúrtium *R. Br.*	Turrìtis *Dil.*	Pteroneùron *Dec.*
Leptocarpæ'a *Dec.*	*A'*rabis *L.*	Dentària *L.*
Notóceras *R. Br.*	Párry*a* R. Br.	

Tribe 2. *Alyssi'neæ.*

Lunària *L.* Ricòt*ia* L. Farsèt*ia* Turr. Berteròa Dec. Aubrièt*ia* Adans.
Vesicària *Lam.* *A*lýssum *L.* Clypèola *Gae.* Peltària *L.*
Petrocállis *R. Br.* *D*ràba *L.* Eróphila *Dec.* Cochleària *Tou.*

Tribe 3. *Thlaspi'deæ.*

*T*hláspi *Dil.* Hutchíns*ia* R. Br. Teesdàl*ia* R. Br. *I*bèris *L.* Biscutélla *L.*

Tribe 4. Euclidie`æ.

Euclídium *R. Br.* Octhòdium *Dec.*

Tribe 5. Anastati'ceæ.

Anastática *L.*

Tribe 6. *Cakali'neæ.*

Cakile Tourn. Chorispora *Dec.*

Suborder II. *NOTORHI'ZEÆ* o ||

Tribe 7. *S*isymbrie`æ.

Malcòm*ia* R. Br. *H*ésperis *L.* *S*isýmbrium *L.* Alliària *Adans.* *E*rýsimum *L.*

Tribe 8. Cameli'neæ.

Camelìna *Crantz.* *Néslia* Desv.

Tribe 9. *L*epidi'neæ.

Corónopus *Sm.* Capsélla *Mönch.* *L*epídium *L.* Æthionèma *R. Br.*

Tribe 10. *I*sati'deæ.

*I*sàtis *Bauh.* *M*yàgrum *L.*

Suborder III. *ORTHOPLO'CEÆ* o > >

Tribe 11. *B*rassi'ceæ.

*B*rássica *L.* Moricánd*ia* Dec. *E*rùca *Tou.* *S*inàpis *Tou.* Diplotáxis *Dec.*

Tribe 12. *V*e'lleæ.

*V*élla *L.* Succòw*ia* Med. *Carrichtèra* Adans.

Tribe 13. *Zi'lleæ.*

Zilla Forsk. *Calepina* Ad.

Tribe 14. *R*apha`neæ.

Crámbe *Tou.* *R*apístrum *Desv.* *R*áphanus *L.*

Suborder IV. *SPIROLO'BEÆ.* o || ||

Tribe 15. *B*unia`deæ.

*B*ùnias *L.*

Tribe 16. *E*ruca`riæ.

Erucària *Gært.*

Suborder V. *DIPLECOLO'BEÆ.* o || || ||

Tribe 17. Heliophi'leæ.

Heliópbila *L.*

Tribe 18. Subularie`æ.

Subulària *L.*

§ *Of doubtful station.* — Schizopétalon *Sims.*

(*To be continued*)

Art. IX. *Nótulæ Botánicæ.* By G. A. Walker Arnott, Esq.

Erióphorum. — Having lately received specimens of the Erióphorum pubéscens (*fig.* 98. *a*) of Sir J. E. Smith's *English Flora*, from Mr. Baird, found in the bog at Lammerton Toll, three miles west of Berwick, I beg to send you the following remarks: —

Smith, although he has distinguished this species (whether rightly or not I shall not here give my opinion) from E. polystàchyon (*b*), and added the synonym of Poiteau and Turpin (*Fl. Par.*, t. 51.), does not seem to have been aware that it is a generally diffused, and, consequently, an often described species. In Scotland it is, I believe, not uncommon; but I state this with doubt, as, trusting to procure specimens of E. polystàchyon, a plant supposed very common (and with which I also had confounded E. pubéscens), whenever I chose, for my herbarium, I have delayed from day to day, and year to year, and can only, at this moment, boast of a few miserable *morceaux;* some of which, however, are E. pubéscens. In England it has been found on Wallington Moors by Mr. Trevyllian, and indicated by him there under the name of E. grácile. From the neighbourhood of Paris I have not yet received it, but I possess it from Switzerland, under the name of E. latifòlium; and, from the description (pedunculis scabris) given by Schrader and all foreign botanists, including Roemer and Schultes, as well as Sprengel's *Systèma Vegetabílium,* that Swiss specimen appears rightly named; whence we must transfer the synonym of the *English Flora* to E. pubéscens, or rather we must adopt for the species the name of E. latifòlium, and reduce under it the E. pubéscens of Smith. From Canada I have also received a specimen, under the name of E. angustifòlium *Pursh;* but, as I have at present no opportunity of examining the specimen of that author, I dare not cite that as a synonym.

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With regard to E. grácile, it is always described with, and ought to be readily distinguished by, the triangular leaves. I have not, however, been so fortunate hitherto as to receive from any correspondent abroad the plant which foreign authors have described under that name, or its synonym E. tríquetrum; but in the British specimens which I have examined, found by Mr. G. Don on Ben Lawers, the leaves are decidedly, particularly the radical ones, plane at the base, and only triangular in their upper half; and, from the whole habit, I feel inclined to refer it to E. latifòlium (E. pubéscens *Sm.*).

It is, however, but justice to Dr. Smith, here to state that I have seen neither Mr. Bruce's nor Mr. Holmes's specimens, and that even the plant which I have received from Mr. Baird, and which accords tolerably well with Smith's specific character (he says the peduncles are *downy;* in my specimen they are rather covered with close set, somewhat rigid, setulæ, or bristles), does not by any means agree with his lengthened description, when he says that these peduncles are clothed with *fine silky hairs.* My plant is certainly E. latifòlium; and should I have made an error in supposing it to be Dr. Smith's E. pubéscens, I hope some of your readers will correct me, and put into my possession the true plant of the *English Flora.*

I can scarcely pass over in this place the E. angustifòlium. This has the leaves almost linear, and I feel doubtful about its being so common as is usually thought, most specimens I have seen under that name being E. polystàchyon. The synonym of Vaillant (*Fl. Par.*, t. 16. f. 1.), or E. Vaillánt*ii* Poiteau and Turpin (*Fl. Par.*, t. 52.), has been cited under it by Sir James; and of that plant Merat says the leaves are triangular, but Gaudin that they are somewhat broad and carinate; and in my specimens from Paris, given me by M. Adolphe Brongniart, the leaves are lanceolate, and only triangular towards their points. Hence, as the peduncles are perfectly glabrous, I would refer it to E. polystàchyon. It is, however, I allow, a remarkable variety, as the lower or broad part of the leaf appears complicate or folded together; a circumstance that may have led some botanists to suppose that the base was itself triangular.

Most foreign botanists make but two species of E. angustifòlium, latifòlium, and polystàchyon, and distinguish them by the smooth or scabrous peduncles. E. grácile is separated from them by its filiform and triangular leaves, erect spikes, and hirsute peduncles; but, in my opinion, it bears precisely the same relation to E. angustifòlium that E. latifòlium does to E. polystàchyon.

(*To be continued.*)

Art. X. *The principal Forest Trees of Europe, considered as Elements of Landscape.* By J. G. Strutt, Esq.

(*Continued from* p. 42.)

In my former communication, I endeavoured to give your readers an idea of the general figure and character of the oak, with respect to pictorial effect in landscape, whether considered as a solitary object to adorn the foreground, or as united into groups, or as the extensive line of a distant forest. I then found it sufficient to arrange my subject in three principal divisions, the stem, the limbs, and the masses of foliage; I must now proceed to exhibit the more minute peculiarities and distinctions of the oak, the character of its spray, the ramification of its branches, and the peculiar and individual appearance of its foliage. With respect to the first of these heads, I cannot do better than quote the remarks of Gilpin. "In the spray of trees," he observes, "nature seems to observe one simple principle; which is, that the mode of growth in the spray corresponds exactly with that of the larger branches, of which, indeed, the spray is the origin. Thus the oak divides his boughs from the stem more horizontally than most other deciduous trees. The spray makes exactly in miniature the same appearance. It breaks out in right angles, or in angles that are nearly so; forming its shoots commonly in short lines: the second year's shoot usually taking some direction contrary to that of the first. Thus the rudiments are laid of that abrupt mode of ramification, for which the oak is remarkable. When two shoots spring from the same knot, they are commonly of unequal length; and one with large strides generally takes the lead. Very often, also, three shoots, and sometimes four, spring from the same knot. Hence the spray of the oak becomes thick, close, and interwoven; so that, at a little distance, it has a full rich appearance, and more of the picturesque roughness than we observe in the spray of any other tree. The spray of the oak also generally springs in such directions as give its branches that horizontal appearance which they generally assume."

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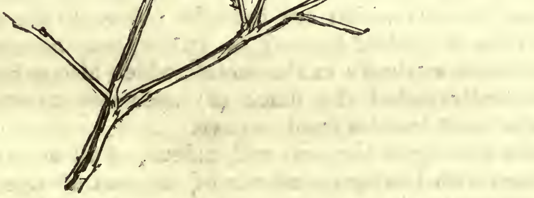

In the above illustration (*fig.* 99.) it will be seen that the spray seldom shoots from the lower or underside of the branches, which, added to the roughness and strength of their component parts, enables the branches to stretch out and maintain their horizontal position, not unfrequently even to the very last twig; although sometimes, from the great weight of foliage, and perhaps from some difference in the species of the tree, an oak may be found with pendent boughs.

The ramification of trees is of great importance to the painter. As well, it has been observed, might an artist attempt to delineate the figure of a Hercules, without expressing any of the muscles in his body, as to give the drawing of an oak tree without a scientific regard to the anatomy of its form, in a just display of the various angles and tortuous irregularities of its branches. The accompanying example (*fig.* 100.) is sketched from the denuded boughs, to give a more uninterrupted view of their peculiar character.

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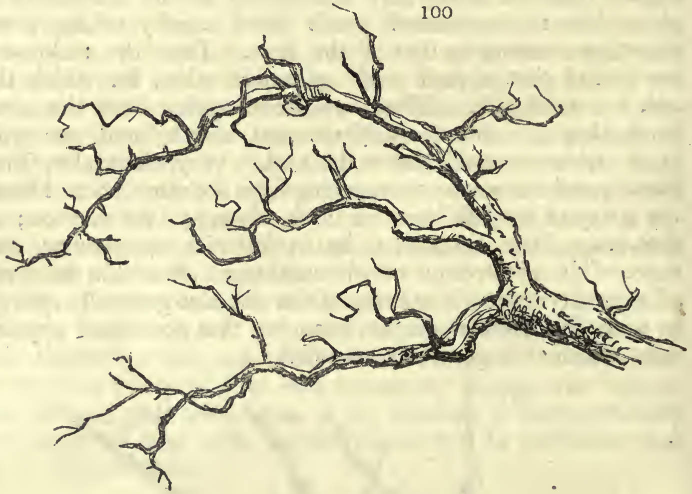

The foliage of the oak is particularly suited to the pencil. In those portions which are brought nearer to the sight, the form of the individual leaves (*fig.* 101. *a*) may here and there be expressed, as shown in the sketch, which also exhibits what is technically called the touch (*b*) necessary to express its character as it recedes from the eye.

The colouring of the oak, and, indeed, of all natural objects connected with landscape, admits of so great a variety, that it is impossible to give any precise rules on the subject. A diligent attention to nature will alone, in this respect, avail: for, besides the ordinary varieties induced by change of season, from the tender and emerald hues of spring to the deeper bloom of summer, and the rich and glowing tints of autumn, an astonishing diversity of colour is effected by accidental circumstances, dependent on the different aspects of morning, noon, and evening; on sun and on shade; on the colours of the sky and the

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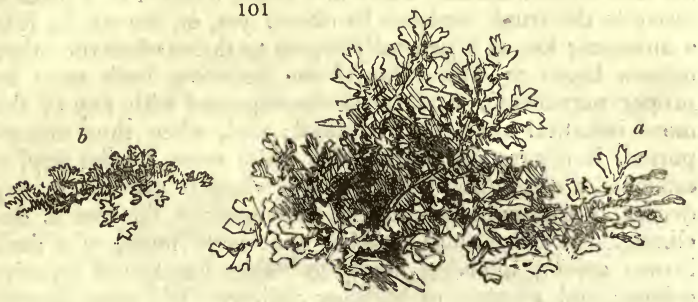

clouds; on the clearness or haziness of the atmosphere, and its consequent powers of refraction; on opposition of colour; on the situation of the spectator; and on many other contingencies, all independent of the *local* colour of the object, yet all strongly affecting it. It is impossible, therefore, I repeat, to give, in any written description, with tolerable conciseness, sufficient instruction for selecting the colours necessary to depict these objects, so constantly varying in their hues. A few simple tints on the pallette, and an hour's study in the forest, will be more instructive than a volume of remarks. The attention and minuteness with which a lover of nature will examine a favourite object, and the truth with which he will consequently be enabled to describe it, are so strongly evidenced in the following passage, extracted from the works of the amiable writer before quoted, that I shall make no apology for transcribing the whole passage: — " I have often stood," says he, " with admiration before an old forest oak, examining the various tints which have enriched its furrowed stem. The genuine bark of an oak is of an ash colour, though it is difficult to distinguish any part of it from the mosses that overspread it; for no oak, I suppose, was ever without a greater or less proportion of these picturesque appendages. The lower parts, about the roots, are often possessed by that green, velvet moss, which, in a still greater degree, commonly occupies the bole of the beech, though the beauty and brilliancy of it lose much when in decay. As the trunk rises, you see the brimstone colour taking possession in patches. Of this there are two principal kinds; a smooth sort, which spreads like a scurf over the bark; and a rougher sort, which hangs in little rich knots and fringes. I call it a brimstone hue by way of general distinction, but it sometimes inclines to an olive, and sometimes to a light green. Intermixed with these mosses you often find a species almost perfectly white. Before I was acquainted with it, I have sometimes thought the tree white-washed. Here and there, a touch of it gives a lustre to the trunk, and has its effect: yet, on the whole, it is a nuisance; for, as it generally begins to thrive when the other mosses begin to wither (as if the decaying bark were its proper nutriment), it is rarely accompanied with any of the more beautiful species of its kind; and, when thus unsupported, it always disgusts. This white moss, by the way, is esteemed a certain mark of age, and when it prevails in any degree, is a clear indication that the vigour of the tree is declining. We find, also, another species of moss, of a dark brown colour, inclining nearly to black; another of an ashy colour; and another of a dingy yellow. We may observe also touches of red, and sometimes, but rarely, a bright yellow, which is like a gleam of sunshine; and in many trees you will see one species growing upon another, the knotted brimstone-coloured fringe clinging to a lighter species, or the black softening into red. All these excrescences, under whatever names distinguished, add a great richness to trees; and when they are blended harmoniously, as is generally the case, the rough and furrowed trunk of an old oak, adorned with these pleasing appendages, is an object which will long detain the picturesque eye."

As it is thus more particularly in old age that the oak is valuable to the painter, we shall conclude the present article with a description of the Cowthorpe oak, extracted from the *Sýlva Británnica*, together with a portrait of the tree from a drawing made upon the spot. (*fig.* 102.)

"This gigantic and venerable tree stands on the extremity of the village of Cowthorpe, near Wetherby, in Yorkshire, in a retired field, sheltered on one side by the ancient church belonging to the place, and on another by a farm-house, the rural occupations of which exactly accord with the character of the oak, whose aged arms are extended towards it with a peculiar air of rustic vigour, retained even in decay; like some aged peasant, whose toil-worn limbs still give evidence of the strength which enabled him to acquit himself of the labours of his youth. It is mentioned by the late Dr. Hunter, in his edition of Evelyn's *Sýlva*, in the following note on a passage respecting the extraordinary size of an oak in Sheffield Park: "Neither this, nor any of the oaks mentioned by Mr. Evelyn, bears any proportion to one now growing at Cowthorpe. The dimensions are almost incredible. Within three feet of the ground it measures sixteen yards, and close by the ground twenty-six yards. Its height, in its present ruinous state (1776), is almost eighty-five feet, and its principal limb extends sixteen yards from the bole. Throughout the whole tree the

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foliage is extremely thin, so that the anatomy of the ancient branches may be distinctly seen in the height of summer. When compared to this, all other trees are but children of the forest." (Book iii. p. 500.)

This description so nearly answers to the present state of the tree, that it does not appear to have suffered any considerable deprivation since the above period. In girth, indeed, it is inferior to the magnificent remains of the oak in Salcey Forest; but, altogether, it is a noble and imposing ruin, on which it is impossible to look without entering into the wish suggested to an ingenious writer by the sight of a similar object, and poetically expressed in the following lines: —

> "When the huge trunk, whose bare and forked arms
> Pierced the mid sky, now prone, shall bud no more,
> Still let the massy ruin, like the bones
> Of some majestic hero, be preserved
> Unviolated and revered; —
> Whilst the grey father of the vale, at eve
> Returning from his sweltering summer task,
> To tend the new-mown grass, or raise the sheaves
> Along the western slope of yon grey hill,

Shall stop to tell his listening sons how far
She stretched around her thick-leaved ponderous boughs,
And measure out the space they shadowed." *Sylva Brit.*, p. 25.

The botanical Characters of the Common Oak are as follows: Quércus (*quer*, fine, *cuez*, tree, *Celtic*) *R*òbur (name given by the Romans to the hardest kind of oak), the Hard, or Common, Oak (*fig.* 103.), belongs to the class Monœ̀cia and order Polyándria of *Lin.*, and to the nat. ord. Amentàceæ of *Jussieu.* The generic character is as follows; and if the inexperienced botanist will take the trouble, in this and in future examples, of comparing the description with the figure, and referring from the one to the other, letter by letter, he will gradually initiate himself in the scientific part of botany.

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Male Flowers.— Amentum filiform (*fig.* 104. *a*), long, loose: Perianth (*b*) one-leafed, subquinquefid: segments (*c*) acute, often bifid.

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Corolla. None.

Stamens. Filaments (*d*) five to ten, very short: Anthers (*e*) large, twin.

Female Flowers (*f*).— Sessile in the bud, on the same plant with the males.

Calyx. Involucre (*g*) consisting of very many imbricate scales (*h*), united at the base into coriaceous hemispherical little cups, the outer ones larger; one-flowered, permanent: Perianth (*i*) very small, superior, six-cleft, permanent: Segments (*k*) acute, surrounding the base of the style, pressed close.

Corolla. None.

Pistil. Germ (*l*) very small, ovate, inferior, three-celled; rudiments of the seed double: Style (*m*) simple, short, thicker at the base: Stigmas (*n*) three, reflexed.

Seed. A nut (acorn) (*o*), ovate-cylindrical, coriaceous, smooth, attached at the base, one-celled, fixed in a short hemispherical cup, which is tubercled on the outside.

(*To be continued.*)

PART II.

REVIEWS.

Art. I. 1. *A Geological Memoir on a Part of Western Sussex, with some Observations upon Chalk Basins, the Weald Denudation, and Outliers by Protrusion.* By P. J. Martin. London. 4to.

2. *On the Formation of the Valley of Kingsclere, and other Valleys, by the Elevation of the Strata that enclose them, and on the Evidences of the original Continuity of the Basins of London and Hampshire.* By the Reverend W. Buckland, &c. &c. &c. Trans. Geol. Society of London, Second Series, Vol. II.

In the prosecution of a science of investigation like geology, a division of labour tends in no slight degree towards its rapid advancement. We are happy to witness so many labourers in the field, each bringing in, by turns, some useful contribution to swell the vast store of accumulated information. During the last few years, a prodigious accession has thus been made to our stock of geological knowledge, and with it, it is presumed, has arisen a corresponding aptitude for its right application. This increasing tendency was at first derived from the exertions of an extremely limited number of enquirers; subsequently, from the combined efforts of the many whose energy was excited by the attractive nature of the science, and by the splendid discoveries of their predecessors.

When we look at the state of English geology now, ennobled by the collateral sciences, and almost essential to a liberal education, we are led to forget that it is a science of our own times, that most of its earliest professors are yet amongst us. We could refer to the period in our remembrance, and that at no very distant day, when, indeed, this department of practical knowledge was in very few hands, and under circumstances of discouragement; when it was confined almost to a solitary individual, of obscure origin, of slender resources, and inadequate patronage, who, after twenty years of laborious research, produced the first delineation of the great geological features of our island. Even prior to this event, which cannot but be viewed as an interesting era in the history of this branch of natural science, a considerable mass of information was acquired by many naturalists, who entered with avidity into a pursuit which combined the charms of novelty and interesting discovery with the substantial advantages of general utility. On all sides, fresh objects of wonder and speculation presented themselves. Entire races of animals, of unknown forms and singular adaptation, inhabitants of a former world, but overwhelmed beneath its ruins, were found to cover the earth with their remains, and were then first subjected to the scrutiny of science. Amongst these were some that could be recognised as resembling tribes peculiar to hot climates, and they were found surrounded with the relics of tropical vegetation, with the palms, the cacti, the arborescent ferns, and gigantic reeds of warm regions, all attesting the changes which our planet had undergone. As the enquiry proceeded, it became apparent that a degree of regularity existed in these deposits, and that certain tribes or genera of animals occupied particular members of the series of rocks. Hence it was naturally suggested that these organic bodies might be employed as indices of the several rocks or beds to which they respectively appertained; and their application has proved of the utmost value, as permanent tests in identifying the strata, when mineralogical characters are altogether unavailing, or, at least, are doubtful evidence. The discovery of these indices to the strata, led to a demonstration of the extent and continuity of the various groups of which they are comprised, and thence to defining with precision the boundaries of each description of rock, of earth, clay, or sand, and to determining the superficial areas they successively occupied after they rose to the surface. This extended acquaintance with the geographical position of rocks, was accompanied by a more accurate knowledge of their contents, as applicable to the economy of man. We were thus enabled to avail ourselves, with greater certainty, of the inestimable resources contained within the bowels of the earth, and to avoid expenses in useless pursuit of objects out of their natural limits. We were also reasonably led to infer that the ultimate result of an elaborate survey of the earth, if that process is not the only one which conducts to a solution of the great problem, would at least furnish safer ground on which to erect a theory of its formation, and to speculate upon its antiquity, and the stupendous revolutions to which it has been subjected. Our progress towards the attainment of the latter objects, has apparently been much slower than our preliminary acquisition of the data. But instances are by no means rare, where a thorough acquaintance with the geological arrangement of a district, and a comparison with parallel cases elsewhere, have suggested reasonable explanations of local phenomena, which must otherwise have remained in their original obscurity. Amongst these may be classed Dr. Buckland's observations on valleys by elevation, and Mr. Martin's reasoning on the Weald denudation. In treating of geology generally, we shall probably take occasion to recount some instances where it has been safely applied as a science of induction. Meanwhile, we shall depart somewhat from the regular course we had prescribed, for the purpose of noticing the memoirs to which we have referred.

The services of local observers are most usefully employed when, like Mr. Martin and Mr. Mantell, they devote themselves to the examination of districts strictly within their immediate cognizance. The circumstances of residence and protracted observation are by no means to be lightly estimated; and when to these are added an extended acquaintance with distant parts of the geological system, and a habit of looking to general features rather than of scrutinising uncertain details, they confer upon this order of contributors an advantage which cannot be too highly appreciated. It is true, the great outlines of our strata have been traced, but some are less perfectly sketched than others. Many extensive intervals yet remain to be filled up, and an immense field is still unexplored with that degree of accuracy which is requisite to the complete developement of all its parts, and a thorough knowledge of its internal structure. A long time will elapse ere the whole work shall have received these elaborate, yet not the less characteristic, touches, so as to exhibit the true features of our country. By the formation of local scientific institutions, by the establishment of provincial collections of natural history, by the cooperation of numerous individuals eminent for their earnest support of these enquiries, and, above all, by the concentration of its most distinguished advocates in the metropolitan society of geologists, the progress of this great undertaking will be rapidly accelerated. We need not add, that to contribute towards the same end, and to diffuse yet more widely a knowledge of this department of natural science, are among the leading objects of this Journal.

The district which forms the subject of Mr. Martin's memoir, is that portion of Sussex and Kent which retains its Saxon appellation of the *Weald.* This is a quarter so abounding in objects of peculiar interest, that it has previously occupied some of our most experienced geologists in investigating them. Possessing characters, in the arrangement and composition of the strata comprised within its area, apparently anomalous, abundance of matter is afforded for speculation; and the controversy which has been elicited by these seeming discrepancies, has occasioned much diligent research, and been the means of illustrating, with more than usual perspicuity, the geological details of this singular country. Messrs. Conybeare and Phillips, in their *Outlines of the Geology of England and Wales*, Dr. Fitton and Mr. Webster in the *Annals of Philosophy*, Dr. Buckland and Messrs. Lyell and Murchison in the *Transactions of the Geological Society*, and Messrs. Mantell and Martin in separate treatises, have severally contributed to elucidate the principal phenomena of the Weald. But the opposite opinions entertained by some of these writers, and the undecided state in which they finally left the nomenclature, after the "green sand" controversy, occasioned for a time some little embarrassment to the geological student, from which it is not, even now, very easy to be wholly free. These difficulties have partly originated in the deviations, to which allusion has been made, from the geological equivalents in other parts of the kingdom, and in the interposition of deposits, which, as far as we yet know, are peculiar to this district.

Remembering that it is our province to render the matter brought before the general reader as intelligible as possible, a few explanatory illustrations of the ordinary arrangements of the strata, drawn, not from imaginary cases, but from authentic sources, will prepare the way for a better consideration of the Weald denudation.

It need scarcely be premised, that the several masses, or deposits, of clay, sand, chalk, and rocks, which contain organic substances, appear in rotation upon the surface of our island, gradually emerging from beneath each other, in regular order, from east to west; and that their truncated edges, particularly in the outcrops of the harder strata, are elevated so as commonly to exhibit an abrupt escarpment towards the west. (*fig.* 105.)

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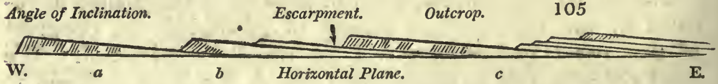

The most westerly is here the lowest stratum in the series, and, of course, had priority of formation; on the contrary, the highest, towards the east, is the most recent. Such is the prevailing order of the stratification, with reference to our own country; and it is observed that this arrangement is never inverted: *a* never appears, for instance, in the situation of *c*, nor changes place with *b*. The relation of certain beds to each other being understood, and the position of any member of the series being determined, we are enabled, with facility, to trace the remainder. This rule is found to hold good in all practical examinations of stratified districts. The *dip*, or angle of inclination, is variable; consequently, the surface, or the exposed area, of any stratum is greater or less, according to the angle that stratum forms with the horizontal plane.

On examining any district composed of stratified rocks, and intersected by valleys, it is commonly seen that the opposite sides of those valleys exhibit corresponding strata, at elevations governed by the dip (*fig.* 106. A A A).

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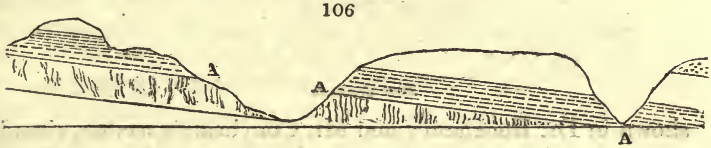

Where the beds are arranged above each other in this parallel manner, they come under the denomination of *conformable*. Where horizontal or parallel masses are placed upon inclined strata, they are then stated to be *unconformable*. An example is here furnished (*fig.* 107.) from a part of the Bristol coalfield in Dr. Buckland's and Mr. Conybeare's section, representing the new red sandstone and lias reposing upon the highly inclined coal measures.

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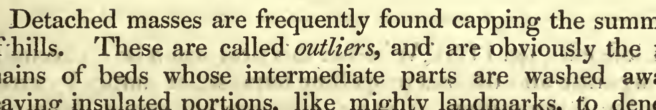
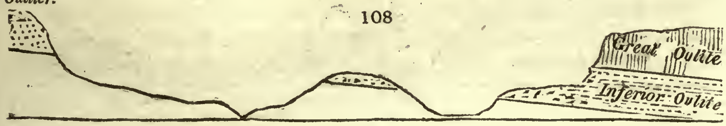


Detached masses are frequently found capping the summits of hills. These are called *outliers*, and are obviously the remains of beds whose intermediate parts are washed away, leaving insulated portions, like mighty landmarks, to denote the ancient extent of the strata. The intermediate spaces that have been laid bare or hollowed out by the action of water, are called valleys, or areas, of *denudation*, a phrase which appears to have originated with the late zealous geologist Mr. Farey. They are also styled valleys of *erosion*, and these are represented in *fig.* 108.

108



Outliers, of the description adverted to, appear on many of the hills which are situated in advance of the great escarpment of the oolite rocks. They may be denominated outliers by denudation. That of Dundry Hill (*fig.* 109.), near Bristol, as

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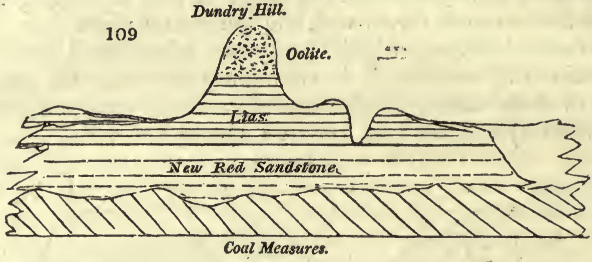

shown in Dr. Buckland's and Mr. Conybeare's section, already referred to, is an excellent example. (See the *Transactions of the Geological Society.*) It also furnishes another instance of unconformable position, and shows that the inclined beds beneath must have been disturbed prior to the deposition of the superincumbent rocks.

Another class Mr. Martin denominates outliers by protrusion. In this case, the stratum having been disrupted, a portion is forced from its parallel and conformable position, so as to become an elevated mass, whose sides form a considerable angle with the direction of the original body whence it was

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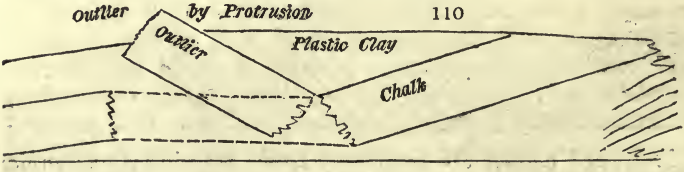

dislodged. (*fig.* 110.) Whether this protrusion be " effected by a separate and distinct propelling impulse, or simply by arrest, by the interposition of some opposing substance, during the subsidence of the main body, it is not now material to enquire."

Amongst the variety of derangements of stratification, may be mentioned those by *subsidence*, the sinking of certain parts

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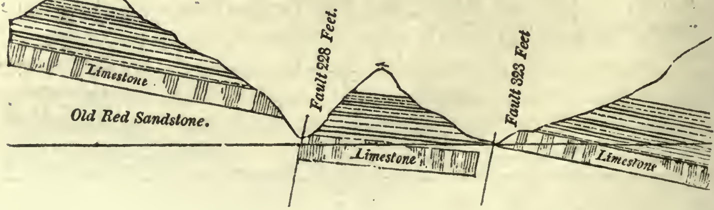

beneath the level of the main portion. In illustration is a sketch of the strata near the edge of the mineral district of Monmouthshire. (*fig.* 111.) Accidents of this kind are more frequent near the outcrop of the strata than deeper in the interior.

By *elevation*, where masses have been heaved upwards, apparently by internal force. (*fig.* 112.) This species of dislocation does not appear to be of such common occurrence as that arising from partial subsidence. Under the description of *faults*, the subject of disturbance in the position of rocks will, with propriety, be resumed.

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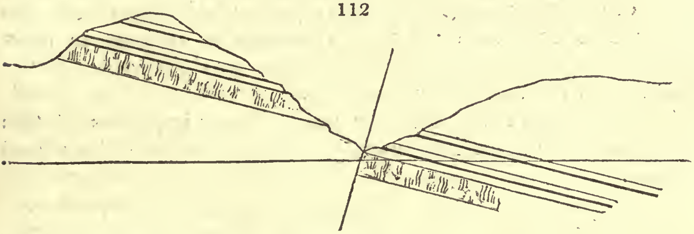

The softer and later-formed strata present fewer instances of disruption than the older and more indurated rocks, particularly those containing the coal-measures, the carboniferous strata of some writers. The sections constructed by Professor Buckland and the Rev. W. D. Conybeare, to elucidate the geology of the district around Bristol, furnish interesting examples of every variety of arrangement; and, by selecting our illustrations from these documents, we desire to manifest our respect for authorities so accurate, we had almost said, so indisputable.

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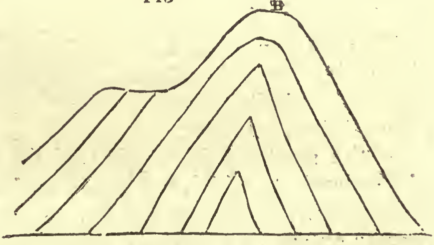


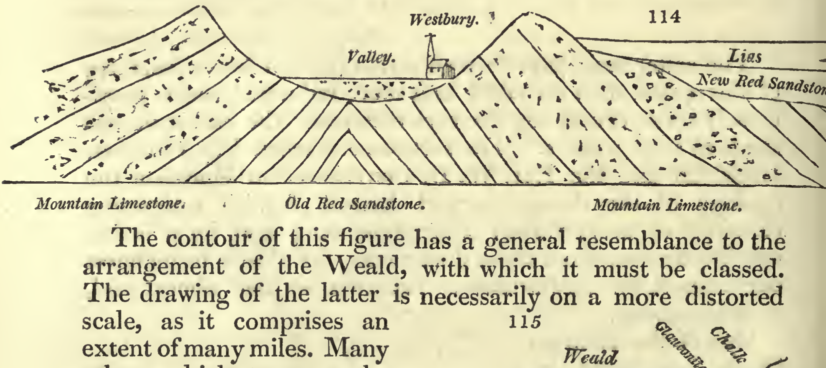
Old Red Limestone.

One of the simplest forms, occasioned by the disposition of the strata, and by which the external form of the earth is modified, is that arrangement denominated the *saddle-shaped* (*fig.* 113.), in which the uplifted edges of the strata are piled against each other, forming a steep ridge, like the roof of a building. Our sketch shows the elevation of Black Down (B), part of the Mendip chain of hills, and 1092 feet above the ocean.

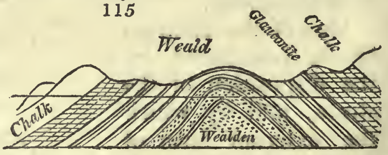
Our next figure (114.) is more complex. It represents a modification of the last, having the crest removed or scooped out, apparently by the subsequent agency of denudation, which process has laid bare some of the inferior beds. These upland valleys are of the class to which the name of *valleys of elevation* has been assigned by Dr. Buckland, from the circumstance of the strata having been apparently heaved upwards by internal force, prior to the removal of the fractured materials in the cavity, and before the edges of the broken strata were rounded or modified by diluvial currents.

In those which are simply valleys of denudation or erosion, the drainage passes longitudinally along their centres; but in those of elevation, as will be more particularly described, the drainage is effected by lateral openings or fissures in their escarpments, forming *transverse valleys*, at right angles to the direction of the *longitudinal* valleys.

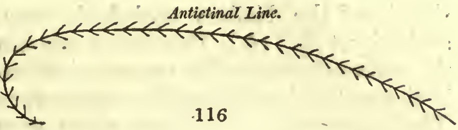
The authors of the *Outlines* notice many instances of this configuration of surface, in the circuit of a few miles round Bristol.



The contour of this figure has a general resemblance to the arrangement of the Weald, with which it must be classed. The drawing of the latter is necessarily on a more distorted scale, as it comprises an extent of many miles. Many others which traverse the chalk range, in various parts of the island, are described to present a similar combination of circumstances.

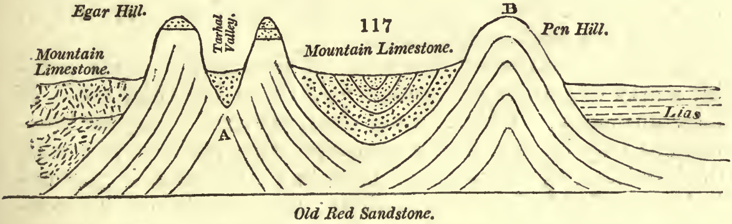


In the masterly description of the south-western coal field of England, to which we have referred, it is shown that this district is made up of a number of *basins* or hollows of less or greater extent, accordingly as the undulations of the inclined strata are more or less rapid; such strata dipping from every point in the circumference of each basin towards its centre. In their map of the district, the authors adopted a mode of describing the boundaries of these basins by what they term *anticlinal lines* (*fig.* 116.), which define the saddles of the strata, or the meeting at the surface of their vertical angles.

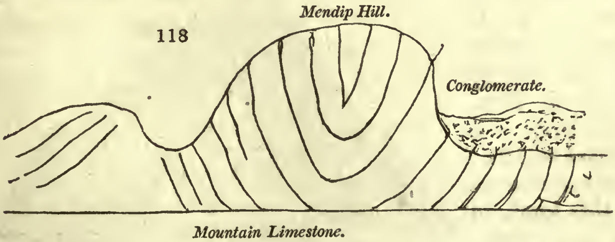


116

It is observed, that sometimes these lines follow the crests of the chains of hills, as in *fig.* 113., and sometimes pass along the course of valleys as in *fig.* 114.; the hills in the latter case being formed, not by the saddles of the strata, but by the escarpments cutting through them. In the map of the Weald denudation (*fig.* 127.) and of the Kingsclere valley (*fig.* 136.), the anticlinal lines pass along the centre of those areas. It thus appears that the direction of these lines is governed, not by the present superficial elevations on the earth's surface, but by the points of intersection of the upraised edges of the strata, whether upon a ridge or in the eroded bottom of a valley. The annexed group (*fig.* 117.) exhibits (at A and B) an instructive example of the opposite circumstances under which the anticlinal lines are sometimes disposed, and shows a section of the central deposit which those lines circumscribe. It consists of part of the Mendip Hills section.

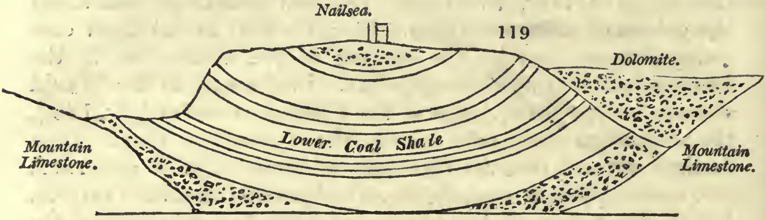


The following figure (118.) represents the *fan-shaped* stratification, being the reverse of the saddle-shaped ridge. This occurs in the mountain limestone at Daleberry Camp.



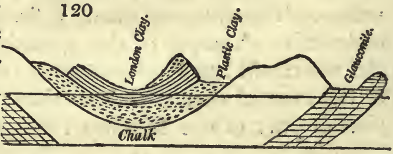
The *basin-shaped* stratification, which is of continual occurrence in coal countries, is well exhibited in the succeeding sketch of the Nailsea coal-field, near Bristol, on the same authority. (*fig.* 119.) This concentric disposition, so common to the carboniferous rocks, seems to indicate a degree of flexibility in the materials, yielding to vast pressure, and mechanical force. The hypothesis of subsidence alone, appears inadequate to produce the phenomena of curvature, so frequently witnessed in coal basins.

119



In strata of a much more recent date, the occasional basin-shaped arrangement is perceived. We might illustrate this by the well-known section of the basin of London (*fig.* 120.), as it is termed, and by that of Hampshire, both of which are occupied with deposits of the most recent origin in our geological system.

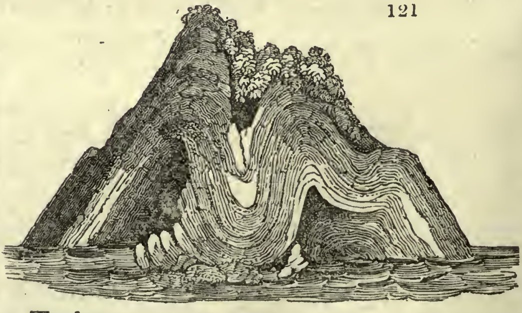
120



It has been observed that some of the ancient strata exhibit marks of greater disturbance and distortion than those of later formation. Of the former class, numerous singular illustrations may be seen in the transition slate rocks. The rock distinguished by the name of mountain limestone, is particularly remarkable for its contortions; an example may be mentioned, at the upper part of the Vale of Neath, in the Dynais rock, where its once flexible beds are twisted into the form of natural arches.

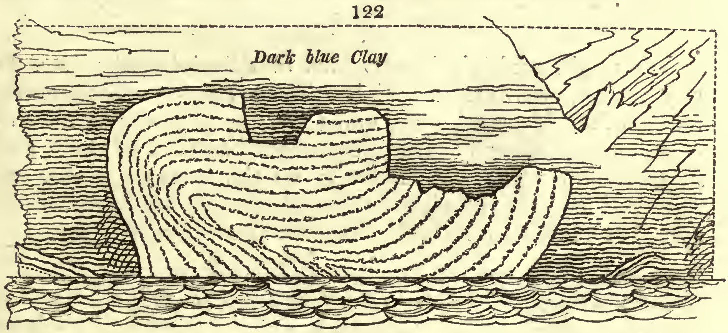
We transfer, from Mr. De la Beche's paper on the *Geology of South Pembrokeshire*, a sketch (*fig.* 121.) of an appearance of this kind, in the coal measures, at Monk's Stone Point, near Tenby.

121



Enormous displacements and flexures of the chalk formation have given rise to geological speculation. In illustration we might refer to the beautiful drawings of Mr. Webster, in his letters to Sir Henry Englefield, on the geology of the Isle of Wight. Curvatures in the chalk of the Isle of Purbeck, of extraordinary figure, were first pointed out by the same gentleman. A remarkable mass of chalk appears in the cliff at Trimingham in Norfolk, and is represented in the accompanying sketch. (*fig.* 122.) It would appear that this was a portion stripped and uplifted from the original horizontal mass; and, if we can judge from the flexuous arrangement of its numerous bands of flints, has been folded by prodigious force into the form of a boulder, on a gigantic scale; its length being seventy, and its height twenty, yards. The surf has considerably reduced its dimensions, but it is still a conspicuous object to the mariners, its white outline being relieved against the dark blue clay in which it is embedded; and, as it is somewhat more indurated than the surrounding mass, it forms a small headland.

122

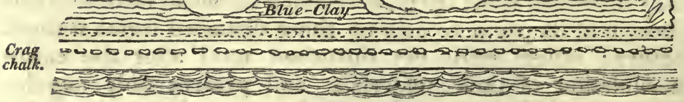


In all the cases of stratification we have endeavoured to illustrate, their derangements must have taken place subsequently to their original formation. Some of these strata were apparently disturbed while the mass retained sufficient flexibility and adhesion of its parts, to assume those distorted forms without fracture; others were not disturbed until after the entire consolidation of their materials, and present only angular fractures and disrupted planes. It cannot be doubted that the deposition of most of the ancient strata took place, while the waters from whence they subsided were in a comparative state of quiescence. Of this fact, the fine preservation of the most delicate shells, and other organic bodies affords unequivocal testimony. Of a different character, however, is that accumulation of heterogeneous materials, which often forms a thick covering over the regular strata, and has obtained the name of *diluvium*, as resulting from that catastrophe which so greatly modified the face of our earth. It is impossible to conceive any thing more strongly indicative of the tumultuous action of prodigious currents than those deposits display. — On the Norfolk coast, where they arrive at their greatest thickness, an abundance of characteristic sections are exposed. The following (*fig.* 123.) was sketched in 1824, and shows part of the cliff, about 100 ft. high, west of Cromer.

123

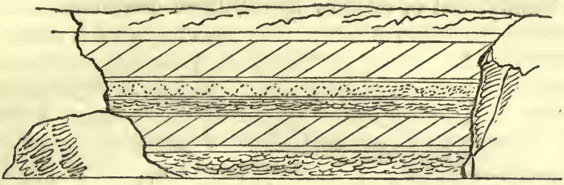
We might multiply illustrations of *diluvial contortions*, to any extent, were it essential. They consist of concentric layers of sand, gravel, clay, and chalk, or of irregular beds of each, and occasionally exhibit enormous boulders of chalk, and fragments of rocks. At Beeston, on the same coast, may be observed another singular section, whence the following sketch (*fig.* 124.) is taken. In both cases, the whole reposes upon *crag*.

124



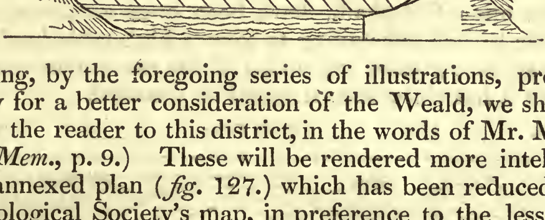
Our geologists have scarcely decided whether the ferruginous sands of the eastern counties, containing the marine shells, locally termed *crag*, should be arranged as appertaining to this great diluvial deposit; some considering it as proper diluvium, while others are inclined to view it as a distinct marine formation, covered by diluvium, and reposing its southern portion upon the London clay, and its northern immediately upon the chalk. Without adverting further to that point, we subjoin two sections of its beds, for the purpose of augmenting our illustrations of stratification.

125



The above (*fig.* 125.) represents a common form in the disposition of the layers. In these cases, the horizontal divisions appear to indicate a succession of eras, or periods of deposit; the intermediate beds are frequently arranged in oblique planes. The site is near Orford, Suffolk, where the crag forms a coarse sandstone, containing several fossil sponges, and is used as a soft building material. The following sketch (126.) is from the ferruginous shelly crag of the caverns near Languard Cottage.

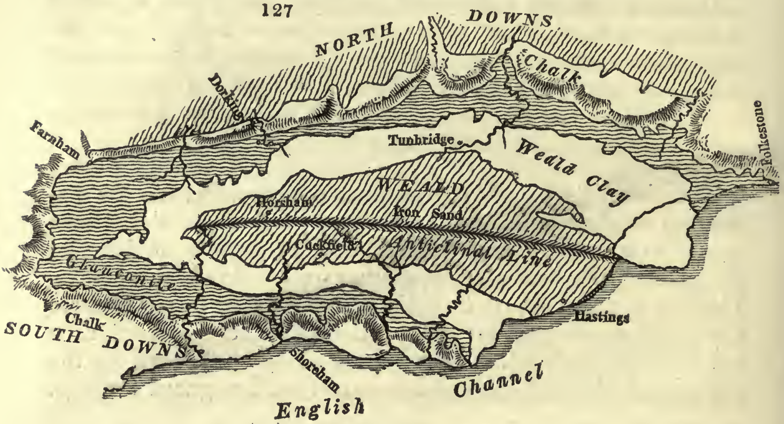
126



Having, by the foregoing series of illustrations, prepared the way for a better consideration of the Weald, we shall introduce the reader to this district, in the words of Mr. Martin. (*Geol. Mem.*, p. 9.) These will be rendered more intelligible by the annexed plan (*fig.* 127.) which has been reduced from the Geological Society's map, in preference to the less accurate one which accompanies the Memoir.

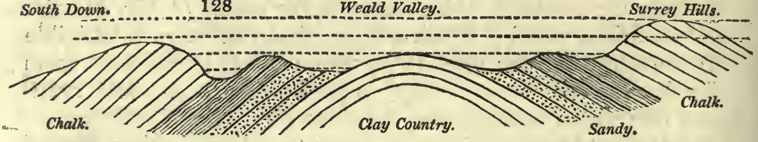
" It must be well known to every traveller who has crossed this valley, that, upon descending from the chalk hills in any part of its western extremity, he enters upon a tract of sandy country, occasionally rising into considerable eminences, and of very varied agricultural aspect. From thence he descends still farther into extensive, woody, and cultivated districts of clay soil, and of exceedingly undulating surface. Traversing this clay country, locally called, and by notoriety, the proper 'Weald,' he emerges again across the same sand to reach a range of chalk hills, similar to those he left behind him. In the eastern part of the valley, the same series is observed, with the difference, that the sands immediately below the chalk are not so prominent, and the middle of the clay country has a greater intermixture of sandy lands, not destitute of picturesque beauty, but of inferior agricultural character.

127



"The space thus comprised has otherwise, in geological language, got the name of the 'Weald Denudation;' because there is every reason to believe, from the uniformity of the structure of the valley, and the regularity and peculiar disposition of its chalk boundaries, that the chalk itself, in all its subordinate strata, with perhaps some others often found incumbent upon the chalk, have been once continued over it from side to side (all uniting to form a high table-land, but a small part of a greater expansion of the same materials), and of which it has since been stripped or denuded.

128



"To explain better what is understood by this denudation, or stripping off of the chalk strata, let the reader imagine a plain of chalk, covered or not with other lands of a kindred nature, extended over a part of France, and continued without interruption to the north of England. Let him then suppose, that, looking from above the Alton Hills, he sees the chalk, with its accompanying strata, rent asunder; part sinking southward, to give a bed to the English Channel, from the race of Portland to Beachy-Head (leaving some fractured portions standing, to tell the story of convulsions), part northward, to form the south side of what is called the London basin, from Marlborough Downs to the Straits of Dover.

"Let him also suppose, that, whilst this is in progress, and all the immense intervening masses are fissured and crumbled by convulsion, a flood of water, powerful beyond comprehension, at the same instant, or immediately after, rushing over, and entering the broken surface, sweeps the whole contents of what is now the weald excavation before it, into the North Sea — itself but a part of the abyss just then opened, perhaps by the same concussion, to receive them.

"Or, let

> "'A change come o'er the spirit of his dream,
> That is not all a dream.'

Let him suppose this part of our island lifted up out of the ocean by an impelling power from below, some parts of it more steadily and evenly, others with such irregular and successive heavings, as to produce the effects above spoken of; disruption of the central parts, and such fissuring and rending of the circumference, as an irregular action is calculated to produce upon a ponderous and frangible material.

"Such a dream, splendid as it may be, will fall far short of the reality of those changes that can be demonstrated to have taken place in parts of the world, well understood to be more ancient than these under consideration.

"If the mind is staggered at the immensity of such an operation, let it be answered, that the Weald Valley is but a small furrow on the earth's surface. And let our thoughts revert for comparison to many greater natural phenomena; to the height of the Himalaya, which may be well supposed to have felt the power of the same ocean stream, perhaps to have been lifted out of it, or to the five miles of depth, which may be given to that ocean; and then consider how small a proportion the aggregate ten miles holds to the diameter of the globe itself.

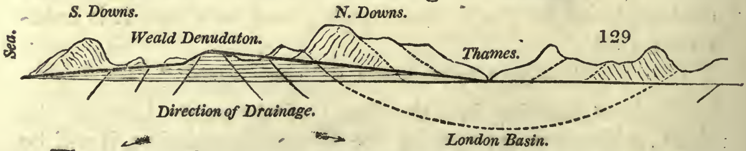
"Nothing is great, nor nothing little, in the operations of nature; and such disclosures as these sink into insignificance before the wonders of astronomy! The mind is lost in the contemplation of the immeasurable power to which it is indifferent, that

> "'Now a bubble bursts, and now a world.'"

Without entering into the detail of the strata beneath the chalk, which are exposed by the Weald denudation, it will be sufficient here to state that they are recognised by the names of malm-rock, or green sand, the gault or blue marl, and the upper ferruginous sand, all of which are now classed by the author under the comprehensive term *glauconite*. Beneath this occurs another group, on which he has conferred the name of *wealden* *, consisting of the Weald clay, with alternating beds of sand and and of Sussex or Petworth marble; and the deposit called the Hastings, or iron, sands, with its accompanying beds of clay, sandstone, and calcareous grit. Descriptions of the characters, areas, and peculiar fossils of all these formations may be consulted in the memoirs of Mantell, Martin, Webster, Murchison, Dr. Fitton, and some other writers. The structure of the Weald is well represented in the sections of Kent and Sussex, by Mr. William Smith, and explained in the article on Valleys of Elevation, by Dr. Buckland, with whom that term originated.

It has been observed, by Messrs. Conybeare and Phillips, that the course of the rivers watering this district, and the configuration of the valleys which convey them, present a very interesting geological phenomena. The great valleys of the Weald were remarked to be parallel to the direction of the strata; but these do not form the channels through which any of the more important streams seek the sea. These rivers flow from the centre towards the north and south, at right angles both to the Weald and to the strata by which it is encircled, through gorges opened across the strata, instead of being turned by their escarpments into the great Weald valleys, as they would be if the fractures in these escarpments were filled up. There is here displayed one of the many instances of a double system of valleys, crossing each other transversely, which the authors, from whom the preceding description has been abridged, were amongst the earliest to point out.

The following diagram (*fig.* 129.) exhibits the geological position of the Weald denudation, bounded by the chalk basins of London and Hampshire, "between which it lies like a trough or gulley; or like a third basin elevated between the other two, and draining its waters into them through cracks or channels in its sides." (*Martin*, p. 55.) By the strong lines drawn from the centre of the Weald, it is intended to mark the mode in which the drainage is effected.



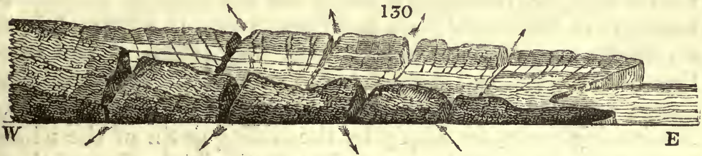
The principal ravines, or transverse fissures, are observed to have a remarkable correspondence on each side of the Weald,

* It is doubtful whether either of these terms will become current among geologists.

particularly in the escarpments of the chalk, " and in several instances are directly opposed to each other; which could not have happened without a simultaneous action and common consent and continuity of parts. The coincidence is therefore the more remarkable, and proves not only the continuity of the chalk strata at the moment of convulsion, but also their uniform density and strength." (*Martin*, p. 61.)

The annexed profile sketch (*fig.* 130.), although inadequate to exhibit the entire characters of a particular case, either of denudation or of valleys by elevation, will, it is hoped, assist in following the descriptions and reasonings we quote. The courses of the rivers which discharge through the transverse ravines are denoted by arrows.

130



Valley of Elevation

From the two preceding sections it will be perceived that the outcrops of nearly the whole series of strata in the Weald are cut through, both to the north and south. These fissures, in some cases, have resulted from subsidence; in others from a compound displacement of the mass. In no instance are these varied disturbances more strikingly exemplified than in the passage of the river Arun through this district. It is important to mention that the strata intersected by these openings have, in several instances, been observed to be lower on the eastern than on the western sides, and that there exists a general longitudinal depression of the whole, from the west towards the east, independently of the dip to the north and south, which our sections show. Hence it is suggested that the force which elevated the Weald strata operated in an oblique direction to their planes.

From all we can collect, the author conceives that the denudation of the Weald was simultaneous with the depression of the London and Isle of Wight basins. " The acts of basining and of denudation were contemporaneous, and stand in the relation of cause and consequences."

" That the Weald vacuity would have been a lake, but for these gullies, is sufficiently evident; but that it has ever been so is by no means probable, from any thing that can be observed at present. The hypothesis which supposes it to have been a lake subsequently to the great catastrophe which hollowed it out, also supposes these outlets to have been the operation of watery erosion, the friction of their own streams, or the *débâcle* of the lake itself. That this could not have been the case, is proved by the existence of more than one of them. The first that gave way would render all the rest unnecessary and impossible; and if every drain had had its separate pool, the water would never have risen high enough in either of them, separately, to force a passage through so many obstacles.

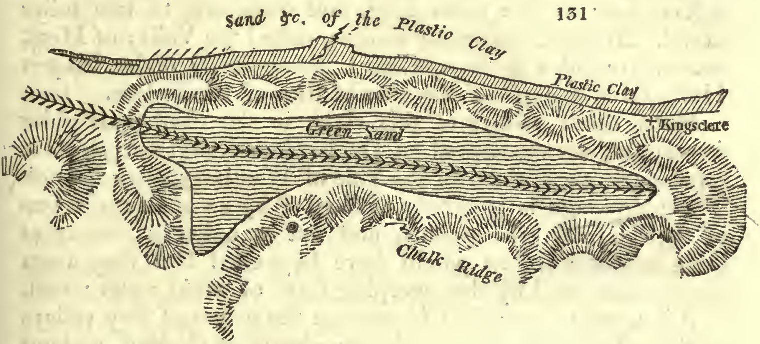
" If, on the other hand, it be proved that these masses are deeply fissured, it is also proved that they have been in motion. And the formation of such a channel as here described, in a direct line through such heterogeneous materials, must have been the result of a simultaneous movement of the whole, let the moving power be what it might. That this operation was coeval with the catastrophe which left the material features of this part of the world such as we see them, is apparent from a collective view of the concomitant phenomena. And whether the Sussex and Surrey hills, with their accompanying strata, were severed by the disruption and dispersion of the intervening parts, or simply by the sliding down of the whole mass, which is much less probable, or the joint effect of these causes, the slightest inclination or obliquity of the basis, upon which it must be supposed to rest, would be sufficient to open the fissures in the direction in which we see them." (*Martin*, p. 74.)

" To the eye of the practised observer, the Weald valley presents the appearance of a great water channel after a flood; some parts of it clean and clear from all incumbrance, others loaded with drift; the banks in some parts torn clean away, in others heaped up with rubbish." (*Martin*, p. 84.)

But, with regard to the notion that the exposure of the strata beneath the chalk, in the Weald valley, is solely the effect of denudation, Mr. Martin is inclined to support Dr. Buckland's views, in withholding his assent to that hypothesis. " I am disposed fully to allow," observes Dr. Buckland, " that the force of water has been sufficient to sweep away the greatest portion of the loose and shattered fragments, which, after the elevation I am assuming, must have covered the axis of this valley, and which must still have remained there, in the form of rubbish, had there been no subsequent diluvial action to drift them away. But I think the slightest inspection of the sections of the Weald will at once convince us, that no power of denudation by water could have produced the doubly inclined position of the entire body of the strata within this district, as well as of the chalk by which it is surrounded; and that we must here again have recourse to a force producing elevation from beneath, along the axis of the valley, if we could find an adequate cause for the effects that have been produced in it, along an extent of sixty miles in length and twenty miles in breadth." (*Geol. Trans.*, vol. ii. p. 124.)

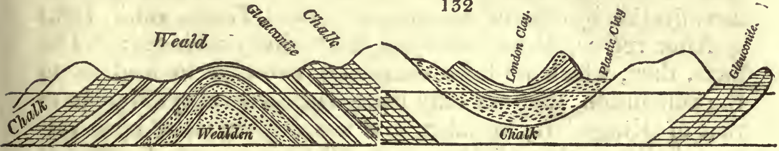
Dr. Buckland's paper on the formation of valleys by the elevation of the strata that enclose them, is so closely connected with the subject of Mr. Martin's memoir, that we shall not find a more appropriate opportunity of adverting to it than

131



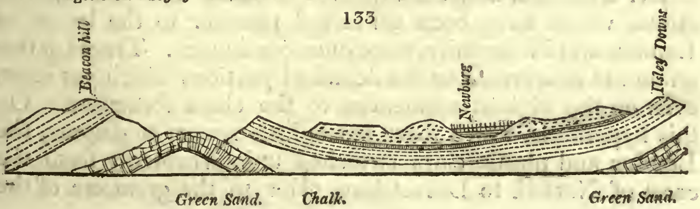
here. The first object of this eminent geologist is, to show the arrangement of the strata immediately to the south of Newbury, and, in particular, to describe that remarkable denudation within the chalk, which contributed to form the Valley of Kingsclere. (*fig.* 131.)

132



On inspection of the section which accompanies the paper, a striking similarity to that of the Weald valley, in connection with the London basin, will be at once recognised, and it will further elucidate the relation between the formation of basins and valleys of elevation. They are both here introduced. (*fig.* 132, 133.)

133



The southern edge of this denudation forms the highest crest of the chalk, Inkpen Hill being 1011 feet above the sea. Its northern edge is less elevated, and the strata of the two escarpments dip, in opposite directions, on each side of the anticlinal line which passes along the centre of the valley.

The interior consists of the green sand formation (glauconite of Martin). The valley comprehended within the escarpment is from four to five miles long, and from one to two miles broad. Another, extremely similar, called the Valley of Ham, occurs five miles to the westward, immediately under Inkpen Hill, and is about half the area of that of Kingsclere.

Many other valleys of this class, in the chalk and older formations, are mentioned by Dr. Buckland, and our *fig.* 113. represents one of them in the Vale of Westbury, near Bristol. Their drainage is generally effected " by an aperture in one of their lateral escarpments, and not at either extremity of their longer axis, as would have happened had they been simply excavated by the sweeping force of rapid water; and, as it is utterly impossible to explain the origin of any valleys of this description by denudation alone, or, indeed, without referring the present position of their component strata to a force acting from below, and elevating the strata along their central line of fracture, I shall venture so far to involve this theory of their origin with the facts which they display, as to designate them by the appellation of *Valleys of Elevation:* of course, due allowance must be made for their subsequent modification by diluvial denudation." (*Geol. Trans.*, vol. ii. 123.)

After reciting these examples, the author concludes: " The facts, then, which we have examined, conspire to lead us to the conclusion, that not only many enclosed valleys similar to that of Kingsclere, but also, in a less degree, many open valleys similar to that of Pewsey and the great central valley of Kent and Sussex, though largely modified by denudation, owe their origin to an antecedent elevation and fracture of their component strata; and these phenomena may be regarded as of frequent occurrence in the formations of all ages, and as indicating the multitude of disturbing causes by which the earth's surface has been affected." (*Geol. Trans.*, vol. ii. p. 125.)

Dr. Buckland adduces evidence to show that the superior strata, which have been conceived peculiar to the basins of London and Hampshire, were once continuous. Traces of this union are observable in the detached portions which yet exist, even on the highest eminences of the chalk formation. On this hypothesis, which there seems little reason to dispute, the London and plastic clays stretched uninterruptedly from the coast of Norfolk to Dorsetshire, prior to the great era of the deluge; and, in so doing, they would only conform to the course of all the other formations which crop out to the westward of them.

The tender and destructible nature of the deposits above the chalk, would render them peculiarly liable to be swept away, in some parts, by diluvial currents. Their preservation at other points, and "their separation into the two distinct basins of London and Hampshire, have resulted partly from local elevations and depressions, by subterraneous violence, since the deposition of the plastic clay, and partly from the still more recent removal of much of their substance by diluvial denudation." (*Geol. Trans.*, vol. ii. p. 127.)

Before concluding this article we must return to Mr. Martin, on the supposed depositions of strata in basins. "Although the contents of these chalk basins have been carefully examined and described, no satisfactory explanation of the mechanism or mode of formation of the basins themselves has yet been given; and, since the French naturalists first made use of the term, so much laxity has obtained in the application of the word basin, that it is made to comprehend almost every depression in the earth's surface." (*Martin*, p. 55.)

"The obscurity in which this branch of the subject has been left, appears to have arisen from the difficulty of considering it apart from a general theory of displacement, and from the conflicting opinions prevalent upon that subject; and because geologists, not professed Vulcanists, have been in the habit of considering all displacement as the effect of one of two causes — of subsidence from simple gravity, or excavation by watery erosion." (*Id.*, p. 56.)

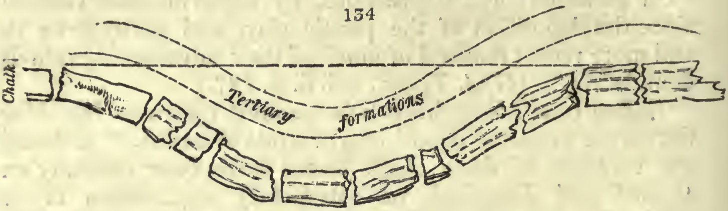
"But, in whatever mode these basins exist, they have been considered as the recipients and continent cavities of successional deposits of different eras and different agencies; and their preexistence is necessarily involved in that consideration. How far this theory agrees with appearances developed by later discoveries, remains to be proved. Some relaxation of the original idea of deposits in the Paris basin exclusively is said to have been made; and the discovery of the same strata elsewhere in a horizontal, and what may be considered an original position, serves to strengthen the opinion, that the strata above the chalk are all of a date anterior to the convulsion which divested it of its flötz character." (*Id.*, p. 57.)

In another place he observes, "Of the English basins it may be safely asserted, that, being fissured in all their parts in the act of subsidence, and many parts of them of higher level than the intervening excavations, *no deposit could have taken place within them* which did not fill *denuded cavities.*

The contemporiety of these acts being established, it follows, of course, that the chalk, with all its superincumbent strata, existed previously in a horizontal position." (*Id.*, p. 89.)

The true disposition of a chalk basin, according to Mr. Martin's diagram (*fig.* 134.), arises from the fracture and subsidence of its parts; for, although large hollows have doubtless been formed upon its surface, its thickness is not adequate to admit of the construction of a basin in that way only.

134



From the foregoing extracts an accordance will be perceived, between these authorities, in the conviction that, anterior to the great derangements of the Weald and the chalk basins, the strata had existed in a horizontal position, and that "what are called *tertiary formations* (those above the chalk) were deposited before the basins were in existence," and covered a far wider area than they have done subsequently to the deluge. "A wide field is thus opened, not for conjecture, but for research; and, if the subject of derangement be cultivated with the same fidelity of observation as has been of late that of structure, results cannot fail of being produced, destructive of many errors, and corrective of many received opinions." (*Martin*, p. 90.)

In a note, appended to Mr. Martin's memoir, some conjectures are offered on the probability of lines of fracture traversing the London clay, over which the Thames is conducted, and on the presumed risk to which the construction of a tunnel would hence be subjected. The direction of these fissures would resemble those in Mr. Martin's diagram. (*fig.* 134.) "A tunnel through the London clay, in those parts where the river has been directed over it, in an *unsubsided* or *undisturbed state*, is perfectly practicable; but, where rent and subsidence, or what are commonly called *faults*, have taken place, there remains nothing but loose diluvial and alluvial soil, through which it must be at all times dangerous to venture. If, therefore, the expedients for repairing the mischief fail in this instance, a spot might still be chosen where the river takes its course over the clay, *that has not been disturbed by the convulsion which basined the chalk*." (*Martin*, p. 89.)

We are a little at a loss to reconcile the latter paragraph with the conclusion to which the author elsewhere arrives, in conjunction with Dr. Buckland, that "the tertiary formations were deposited in a horizontal position before the basins were in existence." Admitting the justice of the conclusion, it is not unreasonable to infer that the incumbent strata would equally partake of the disturbances which so remarkably affected the chalk.

That the accident which impeded the progress of the tunnel was occasioned by a fissure in the strata, of the description alluded to, is, however, by no means apparent from the circumstances. The excavations were too near the surface to afford sufficient proof that it was other than the usual "broken ground" which forms the beds of most valleys. It is well known, and observed in practical operations, such as forming tunnels, driving levels, and sinking shafts, that all formations, whether composed of soft or of indurated materials, are, to a considerable depth below the surface, "shaken" and doubtful, consequently treacherous. No mineral or coal beds "prove," with any approach to certainty, until they have been pursued beyond the influence of the operations which have disturbed the exterior crust of the earth. We do not refer solely to the irregular accumulations of what is called diluvial matter, but to disturbances, diluvial or otherwise, which extend still deeper. It is obvious that the thickness of diluvium or of transported materials is, of all things, the most uncertain, particularly at the bottoms of valleys, and in the beds of rivers. Nothing can present a more ragged outline than a section of the base of a diluvial district, or demonstrate more incontestibly that there is not the slightest agreement between the outline of the base on which the detritus is deposited, and the present contour of the earth's surface.

With regard to the geological position of the Thames tunnel, it has been customary to speak of its passing through the London clay. If the excavation be pursued, it will probably intersect that formation towards the northern portion of the line; but hitherto, from the materials which have been brought up, it is quite evident that the work has proceeded in some of the plastic clay beds, so denominated, agreeing with those exposed at Woolwich, and much less favourably adapted to subterraneous operations, than the tenacious mass of the London clay which reposes upon it. The formations lying immediately to the south-east of London, have by no means been accurately defined upon our geological maps.

T.

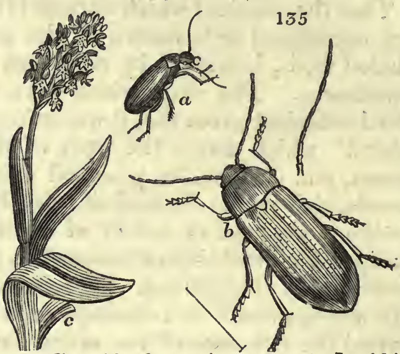
ART. II. *Catalogue of Works on Natural History, lately published, with some Notice of those considered the most interesting to British Naturalists.*

BRITAIN.

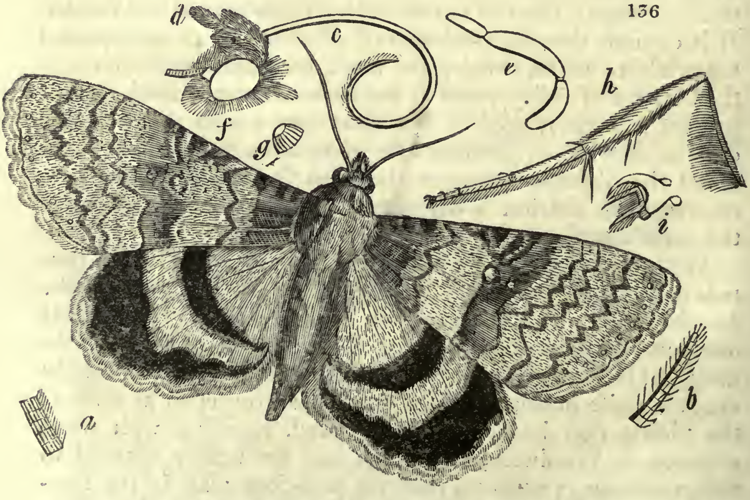
Curtis's British Entomology. In 8vo Numbers, monthly. 4*s.* 6*d.* coloured.

No. LIV. for June, contains

215 to 218. — Teléphorus cyàneus; Coleóptera Telephorìdæ. Of this genus twenty-eight species are natives of Britain; that figured was taken at Ambleside, near some oak trees, while Prímula farinòsa, here figured, was in flower abundantly at the same time.—Dascíllus cervìnus; Coleop. Telephorìdæ (*fig.* 135., natural size, *a*, magnified *b*); of which there are several varieties, which appear in May and June, and are very abundant in the north of England and in Scotland. The Dwarf Orchis (*O.* ustulàta) was in flower on Arthur's Seat, near Edinburgh, where



Mr. Curtis gathered his specimen.—Catocàla elocata (*fig.* 136. *c*); Lepidóptera Noctuàdæ. The caterpillar of which feeds upon willows and elms.



Gen. Char. — Antennæ alike in both sexes, inserted in the crown of the head close to the eyes, long, slender, and setaceous, externally covered with scales, internally pubescent (*a*), with scattered bristles from the middle to the apex (*b*): basal joint the largest, cup-shaped. Maxillæ as long as the antennæ, convoluted, setaceous, a considerable portion of the apex ciliated with tentacula (*c*).

Labial palpi porrected, obliquely triarticulate, densely clothed with long scales, those on the third joint short (*d*): basal joints slightly nutant and rather long; second a little bent, ascending obliquely, subfusiform; third not so long as the first, slender, elongated ovate (*e*).

Head rather small. Oculi, one on each side behind the antennæ (*f*, magnified *g*). Thorax large. Abdomen robust, cylindrical, attenuated, tufted on the back, at the base, and at the tail. Wings ample, slightly deflexed when at rest, superior subtrigonate. Cilia long and indented. Legs long, anterior the shortest. Tibiæ, anterior short, with a compressed broad spine on the inside, the others spurred, the posterior with a pair towards the middle, all of unequal size (*h*). Tarsi, anterior much longer than the tibiæ, the others of equal length, producing a double series of spines beneath. Claws bent. Pulvilli forming a lobe in the middle, with a slender one very much cut on each side (*i*). Larvæ half loopers, with six pectoral, eight abdominal (the two first being less perfect than the others), and two anal, feet.

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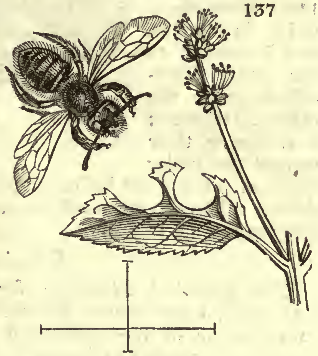

Pupæ enclosed in a loose cocoon formed between some leaves.

Megachìle Willughbi*élla* (Willughby, a friend of Ray's); Hymenóptera *A*pìdæ *Leach;* of which there are seven British species. M. centuncu*l*àris (*fig.* 137.) is figured as living on the Mercuriàlis ánnua.

Bennet's Fishes of Ceylon. In 4to Numbers, monthly. 21*s*.

No. II. for June, contains

Holocéntrus argénteus, a very delicious fish. — Chæ′todon vagabúndus, a very singular creature, exhibiting different shades of purple, orange, yellow, and red, but not much valued by fishermen. C. Brownríggi*i*, about 2 in. long, much sought after as an article of food. — *S*corpæ′na míles (*fig.* 138.), with spines round the eyes, and partially on the lateral line near the head.

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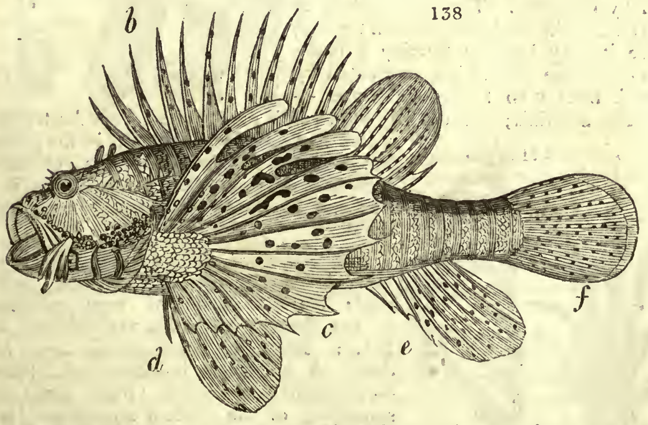

Branchiostegous rays six; dorsal (*b*) thirty-three, thirteen spinous; pectoral (*c*) four; ventral (*d*) six, one spinous; anal (*e*) nine, three spinous; caudal, (*f*) twelve; head arge, with six cirri on the gills; pectoral fins with large irregular black spots. Ventral, anal, dorsal, and caudal fins, with small black spots. *Fig.* 138. is about one tenth of the length of the fish.— Balístes aculeàtus var. víridis. (*fig.* 139.) Green, about 9 in. in length, and belonging to the order Branchiostegous: the others all thoracic; i. e. having their ventral fins under

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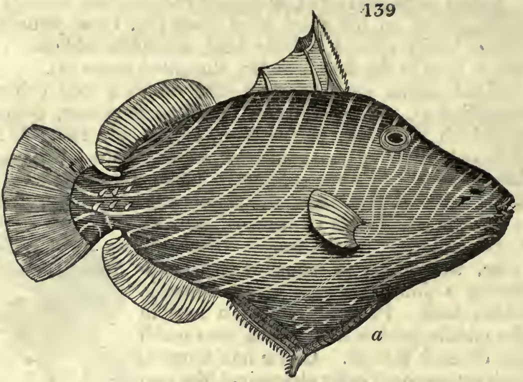

the pectoral, and not before or behind them, like the jugular or abdominal fishes. Branchiostegous fishes are such as have the gills destitute of bony rays. (*fig.* 139. *a*)

Botanical Periodicals.

The Botanical Magazine, for July, contains Artocárpus integrifòlia (*fig.* 140.), Entire-leaved Bread-fruit, which flowered in December, 1827, in the stove of the Edinburgh botanic garden. It belongs to the nat. ord. *U*rtíceæ, has the male and female blossoms on the same plant, the former (*a*) lateral, and the latter (*b*) terminal. The fruit is technically a pod, or pericarp; in the East and West Indies it grows to a very large size, and is eaten by the natives. In the West Indies it is less eaten than in the East Indies; but the seeds, when roasted like chestnuts, are allowed to be good, even by strangers. The tree arrives at the greatest size and perfection in Ceylon, where it may be seen forming a dense mass of foliage 30 ft. high, supported by a trunk from 8 to 12 ft. in diameter.— Dracæ̀na austràlis; nat. ord. *A*sphodèleæ, is a new plant from Australasia, which flowered in May, 1827, in the greenhouse of the Edinburgh botanic garden.— Hedyòtis campanuliflòra; Rubiàceæ; is a new and handsome suffruticose plant, from Brazil.

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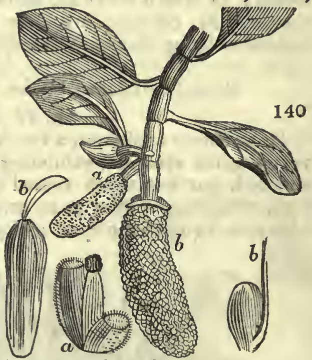

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The Botanical Register, for July, contains Antholỳza (*anthos*, a flower, *lyssa*, rage; fancied aspect of rage exhibited by the flower) æthiópica var. mìnor (*fig.* 141.); Triándria Monogýnia, and *I*rídeæ. A handsome bulbous-rooted plant. —*T*hryállis (an ancient Greek name for something of the mullein kind) brachýstachys, Short-spiked Thryallis. "One of the most obscure genera in the science of natural history. It was established by Linnæus, upon a specimen which has never been seen by any other person." Mr. Lindley considers himself fortunate in having an opportunity of describing a second species, which agrees well with the description of Linnæus.—*C*ombrètum comòsum (*fig.* 142.); Decan. Monog., and *C*ombretàceæ; is a fine climbing plant brought from thickets at Sierra Leone, by Mr. G. Don, and grown here in the stove.

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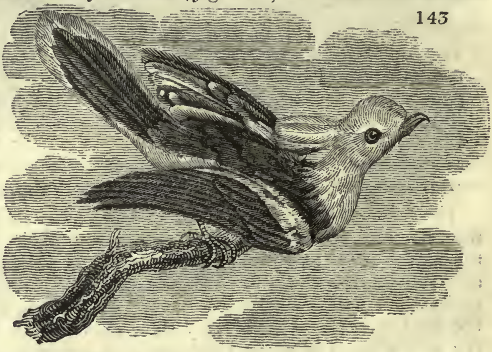
Griffith, Edward, F.L.S., and others: The Animal Kingdom described and arranged, in conformity with its organisation, by the Baron Cuvier. With additional Descriptions of all the Species hitherto named; of many not before noticed; and other original matter. London. 8vo, many plates. Parts I. to XV.

The value of the original work of Cuvier is well established; the duty of the reviewer, therefore, is to ascertain the fidelity of the translation, and the merits of the additional descriptions. It would have given us pleasure could we have bestowed on the correctness of the translation unqualified praise; but justice requires us to say, that, though it generally conveys to the English reader a sufficiently clear view of the author's meaning, there are several parts in which the sense is imperfectly or very incorrectly given. For instance, p. 26 of the translation:—"*Vegetables derive their nourishment from the* SUN, *and from the circumfluent atmosphere in the form of water*," &c. Cuvier says, "the SOIL and the atmosphere present to plants for their nourishment, water," &c. "*Le sol*" may, doubtless, be either the sun or the soil, but the obvious meaning of the author might have directed the translator which word to choose; and, more particularly, as, in the preceding page, there occurs nearly the same passage: "*l'atmosphère et la terre apportent aux végétaux des sucs*," &c. In page 22. of the translation, we find the following remarkable error: "All organised beings produce their like, *otherwise death would be a necessary consequence of life*, and the species must become extinct." This passage is utterly unintelligible, or, to speak more plainly, the extreme of absurdity. The author has before stated that death is a necessary consequence of the continued action of life on the animal frame; and the sentence so improperly translated, refers to this action on the vital organs. "Tous les êtres organisés produisent leur semblables, autrement *la mort étant une suite nécessaire de la vie*, leurs espèces ne pourraient subsister." Nothing can be more clearly expressed, or more easy to translate literally:—"All organised beings produce their like; were it not so, death being a necessary consequence of vital action, the species must become extinct." We might quote other errors in the translation of the first sixty pages, for which it would be difficult to account, except by supposing that the translation has been made from an inaccurate copy of the original.

The notes and the original matter of the translator and his colaborateurs, have greatly increased the bulk of the work; and the number of the engravings have greatly enhanced its price; the latter, at least, without any thing like proportionately adding to its value. The plan of getting up the book has not been properly digested before it was commenced. If engravings were to be given, either every species described ought to have been figured, or only one species of each order, tribe, or genus; or only such figures as were necessary to illustrate technicalities. Instead of this, we have numerous genera, of which a single figure is not given of any one of the species; while of other genera, copperplates are engraved of several of the species. This indefinite, unsystematic mode of giving illustrative engravings, publishers will, in time, learn to avoid, from the necessity which they will find of accommodating their productions to the present improved state of the public judgment in books, called forth, in a great measure, by an increased taste for reading, and the diminished means of procuring this gratification. We can see no occasion for engravings on copper to illustrate a work like the present; had the figures been on wood, they would have been nearly as expressive, or, at least, sufficiently so for every useful purpose, as that which we now give of the Geoffroy's Shrike (*fig.* 143.) will show to those who can compare it with the copperplate from which it was copied in Part XV. They could have been printed along with the descriptions, and more readily compared with them; and, had they been limited to the type species of each genus, the work would have been much more complete, and, we should think, not near so high priced. There is also an omission which detracts from the value of the work. As the system of Cuvier is founded on the physiology of animals, there ought to have been plates given of those parts of the osteology of vertebrated animals which form the distinctive characters. They are not given in the original work of Cuvier, because it was intended to form a cheap text-book, and the reader is supposed to have access to the museums of Paris, and to extensive libraries of natural history; but in a work which will be ten times the price of the original, they ought to have been added. We regret to be obliged to make these objections, and should have been much better pleased to have given the work entire instead of qualified approbation.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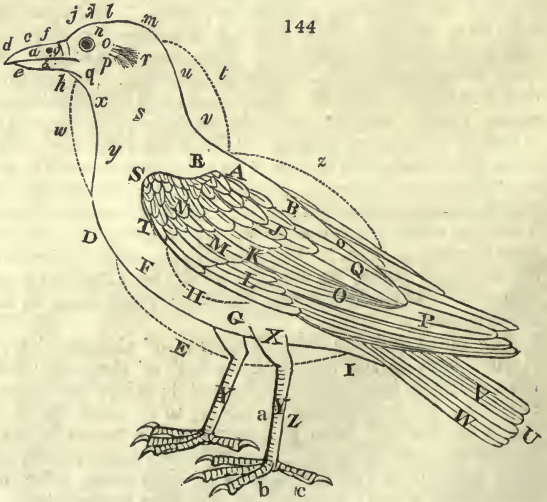
As a principal object of the last number of this Magazine was to impress on the mind of the young reader the terminology of birds, we shall here copy from Mr. Griffith's work an engraving which exemplifies that terminology in a very judicious manner. (*fig.* 144)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a, Maxilla, the upper part of the bill.
g, Nares, the nostrils.
d, Dertrum, the hook.
c, Culmen, the ridge.
f, Mesorrinium, the upper ridge.
i, Lorum, naked line at the base.
b, Mandibulæ, lower part of the bill.
h, Menuon, the chin.
e, Gouys, inferior point of the mandible.
j, Frons, front of the head.
k, Capistrum, the face.
l, Vertex, crown of the head.
m, Sinciput, hinder part of the head.
o, Regio ophthalmica, region of the eye.
n, Supercilium, the eyebrow.
p, Tempora, the temples.
q, Gena, the cheeks.
t, Cervix, hinder part of the neck.
u, Nucha, nape of the neck.
v, Auchenium, below the nape.
s, Collum, the neck.
r, Regio parotica, protuberance over the ear.
w, Guttur, the throat.
x, Gula, gullet.
y, Jugulum, lower throat.
z, Dorsum, the back.
A, Interscapulum, between the shoulders.
B, Tergum, middle of the back.
C, Uropigyum, the rump.
U, Cauda, the tail.
V, Rectrices, tail feathers : Intermediæ, middle; and Laterales, side ones.
J, Ala, the wing.
O, Remiges, the oars.
P, Primariæ, quills.
K, Tectrices, wing-covers.
L, Majores, largest wing-covers.
M, Mediæ, middle wing-covers.
N, Minores, smallest wing-covers.
R, Humeri, shoulders.
S, Flexura, the bend of the wing.
T, Axillæ, the arm-pits.
H, Hypochondria, side of the abdomen.
D, Pectus, the breast.
E, Abdomen.
F, Epigastrum, stomach.
G, Venter, the belly.
I, Crissum, the vent.
X, Tibia, the thigh.
Z, Planta, the foot with the toes.
Y, Tarsus, the foot.
a, Acrotarsium, front of the foot.
b, Digiti, toes.
c, Hallux, the great toe.

Hogg, the Rev. *John.*, A.M. F.L.S. and Camb. Ph. Soc. : On the Natural History of the Vicinity of Stockton on Tees. Stockton. 8vo, pp. 96, 1 map.

This work is to form an appendix to the *Parochial History of Stockton*, by the Rev. John Brewster, now in the press. It is an excellent specimen of the local Flòra, Faúna, and Geográphica, and printed with very great accuracy in regard to names, synonyms, and references to established works containing descriptive and historical particulars. The use of such local catalogues is three-fold; 1. as contributing towards a more complete and accurate natural history of Britain; 2. as pointing out to the inhabitants, or to those intending to inhabit particular districts, the climate and the natural productions which they may expect to meet with, and consequently, to a certain extent, the eligibility of the situation for rural and domestic happiness; and 3. as a record by which future naturalists may determine the local changes which have taken place in natural and physical history.

The catalogue begins with the birds, of which there are no fewer than 126 species, arranged according to the system of Cuvier. Of fishes there are 19 species; of insects, 67 of the most remarkable are enumerated; of fluviatile shells, 20 species; of marine animals, the Sea Scorpion, or Father Lasher (Cóttus *S*córpius *L.*) (*fig.* 145), and Ray's Toothed Gilthead (*S*pàrus Rà*ii*) (*fig.* 146.), both rare species, but the last extremely so. The first specimen of *S*pàrus Rà*ii* found in England was sent to Mr. Ray by his friend, Mr. Johnson, a gentleman of Yorkshire, who informed him it was found on the sands near the Tees' mouth, Sept. 18. 1681. Mr. Hogg informs us that in August 1821 he saw the only one known to have been

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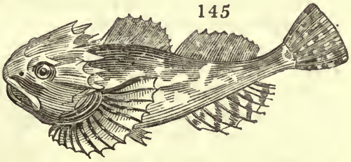

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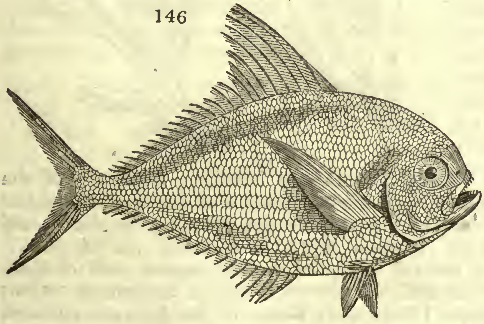

seen near the Tees since that sent to Ray. Of Mollúsca nùda, or shell-less mollusca, 7 species are enumerated, including the officinal Cuttle Fish (*S*èpia officinàlis *Lin.*) (*fig.* 147.), often cast up on the shore at Seaton, and from which is taken the cuttle bone, formerly used in medicine. Of Mollúsca testàcea 34 species are enumerated, chiefly bivalve shells; of M. cirrípedes, 3 species; of M. annelìdæ, 4 species; of M. radiària, 16 species; and of M. polypèria no fewer than 54 species, including the Sea Fir (Sertulària *a*biétina) (*fig.* 148. *a*), a coralline very common on shells and other substances; Tubulària ramòsa (*b*), a branched tubular coralline, also very common; Cellulària cornùta, a horned cellular coralline, also common; Millepòra folìàcea (*c*); Corallìna officinàlis (*d*), very common; and *S*póngia ùrens, occulàta (*fig.* 149. *a*), and fluviátilis (*b*), three British sponges by no means uncommon.

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The plants are arranged according to the natural system, and enter into 50 orders of Dicotylédones, 13 orders of Monocotylédones, and 8 orders of Acotylédones.

The geology of the vicinity of Stockton is comprised under, 1. lias; 2. red marl, or new red sandstone; 3. magnesian limestone; 4. coal measures; 5. diluvium; 6. alluvium; and 7. basaltic dykes.

We should like to see gardeners set about forming such catalogues of the natural history of their masters' estates, or of the parish in which they live. Mr. Wood, of Deepdene, is well qualified for forming such a catalogue, and we hope he will set the example.

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Vigors, N. A., Esq. A.M. F.R.S. G.S. and M.R.I.A., Secretary of the Zoological Society, Editor, with the cooperation of several distinguished Naturalists: The Zoological Journal, No. XII., January to March, and No. XIII., April to July. London. 8vo. 10*s.* coloured; 7*s.* 6*d.* plain.

In these two numbers are some very interesting papers, most of them strictly scientific, and not of sufficient interest to attract the general reader; but some of them, as Major Hardwicke's Loves of the Ants and Aphides, both scientific and amusing, and Mr. Colebrooke on Dichotomous and

Quinary Arrangements in Natural History, which is at once philosophical and highly interesting. Natural orders are related to each other by so many points, that Linnæus compared them to countries in a map; but the affinities of an object, Mr. Colebrooke observes, ramify in every direction, and cannot be well represented on a plain surface. The Dichotomous mode of classification has been so represented. "It proceeds upon a selection of single characters in succession, which, taken affirmatively and negatively, furnish at each step two distinctions; one for objects possessing the character in question, the other for such as want it. For example, at the very first step, organic and inorganic substances; and, thereafter, vertebrate and non-vertebrate animals. So, Cotyledonous and Acotyledonous vegetables; and, again, Monocotyledonous and Dicotyledonous plants. If the series in which the characters are severally noticed be judiciously chosen, the Dichotomous arrangement, well pursued, supplies a very instructive key to natural knowledge. Many professedly natural distributions have been so ordered. But a more instructive arrangement is that which exhibits an object in all its bearings; which places it amidst its cognates; and contiguous to them, again, those which approach next in degree of affinity, and thence branching every way to remoter relations." Objects or groups to be so arranged must occupy a space of three dimensions. Were the space so occupied indefinite, and round any given or imaginary point, the form of the group would be considered globular, from the same law of imagination by which the sky seems vaulted, and the universe neither square, nor long, nor angular. Hence, as five points form one of the simplest modes of expressing the centre and superficies (the two poles and the zenith and nadir of a globe), the Quinary arrangement is the simplest distribution of a large assemblage of objects. The centre group may be supposed to be the type, and the four circumferential ones so many clusters of related objects. If we imagine no perfect type, and, in consequence, the central group omitted, we shall then have the Quaternary arrangement, which, according to Ocken, a Swedish botanist, is the true natural distribution. Without entering farther into the subject, our readers will, we hope, have distinct ideas of the Dichotomous, Quinary, and Quaternary systems; and they will see that the Quinary and Quaternary are but different modes of expression for what is essentially a circular, or, more correctly, a spherical system. These and other systems we shall enter into at greater length, when we conceive our young readers to be sufficiently advanced. In the mean time, it is easy to conceive that the surface of a globe will be represented by three points more easily than by five, and by five less perfectly than by seven or twelve. So that all that seems beyond dispute in the matter is, that the most perfect abstract idea of an arrangement is that in which all the objects composing a group shall be clustered together like a sphere. It should never be forgotten that nature knows only species, and that all systems of arrangement or classification are merely attempts at generalising, for the sake of lessening the trouble of knowing the individuals.

Hooker, William Jackson, LL.D. Reg. Prof. Bot. Univ. Glasg. and F.R.A. and L.S. Lond.; and *Robert Kaye Greville,* LL.D. F.R. and A.S. Edinb. and L.S. London: Figures and Descriptions of Ferns, principally of such as have been altogether unnoticed by Botanists, or as have not yet been correctly figured. Fasc. V. Folio. 1*l.* 5*s.* plain; 2*l.* 2*s.* coloured.

This work will be included in twelve fasciculi, each consisting of twenty plates, accompanied with as many leaves of description, to appear quarterly. The descriptions are written entirely in Latin, and a few remarks added in English; the plates are executed with the greatest attention to accuracy, and in the best style of the art, especially in the dissections of the fructification, from drawings made by the authors. A list of subscribers will be printed in the last number.

Anon.: Attributed to J. Rennie, A.M., formerly Editor of the *Foreign Medical Journal,* and Author of a great number of Works, in almost every Department of Literature: Conversations on Geology; comprising a familiar Explanation of the Huttonian and Wernerian Systems; the Mosaic Geology as explained by Mr. G. Penn; and the late Discoveries of Prof. Buckland, Humboldt, Dr. Macculloch, &c. London. 8vo. 7*s*. 6*d*.

Such a work was much wanted, and, from a slight glance at that before us, and what we know of the author, we have no doubt of that want being now ably supplied.

Jennings, James, Author of *Ornithològia,* and other Works: The Pleasures of Ornithology; a Poem. London. 12mo, pp. 46.

"To ally poetry to nature, to science, to truth, and to humanity, — to make her a useful handmaiden in the accomplishment of great, good, and important ends, — have been the objects in the present production." Mr. Jennings deserves credit for so laudable an attempt, and, if he do not receive so much praise as he could wish, will have the better reward of self-approbation.

France.

Candolle, M. *A. P. de,* F.R.S. F.M.L.S. H.S. &c. of Geneva:

1. Collection de Mémoires pour servir à l'Histoire du Règne Végétal. Mém. 1.: sur la Famille des Melastomacées. Paris. 4to, 10 pl. 10*s*.

The inability of the author, both in his *Pródromus* and *Course of Botany,* to impart to certain points of the science those developements that seemed necessary to fix the attention of botanists, has led him to publish, in a separate form, a series of *Mémoires,* serving as explanatory of the two above-mentioned works. Ten *Mémoires* will form a volume. This work will be accompanied with plates, and may be regarded as a commentary on the *Pródromus.* Each *Mémoire* is sold separately.

2. Prodromus Systematis Naturalis Regni Vegetabilis. Pars tertia, sistens Calyciflorum Ordines 26. Paris. 1 vol. 8vo. Price 12*frs*.

Germany.

Link, H. F., von, M.D. Prof. of Bot. in the Univ. Berlin, Direct. Bot. Gard.; and *F. Otto,* C.M.H.S. &c., Inspect. Bot. Gard.: Abbildungen auserlesener Gewächse, &c. Figures of select Plants from the Royal Botanic Garden of Berlin, with Descriptions and Directions for their Culture. Berlin. Vol. I. 4to, pp. 128. Sixty plants on sixty coloured plates.

This work was commenced in 1820, and has appeared in parts at ten indefinite intervals since that period. One volume is now completed, and the work, we are informed by M. Otto, will be continued in a smaller size. The plates are superior in execution to any thing that has been produced in this country, unless we except Dr. Hooker's *Exotic Flòra;* the descriptions, which are in Latin and German, as far as can be judged by comparing them with the plates, are succinct and accurate. The whole of the sixty plants considered select at Berlin, are reckoned fine plants in this country; the following are still rare here, and those of them marked *, we are informed by Mr. George Don, are not to be met with in British gardens:

Aristolòchia ríngens.
A'rum pedàtum.
Begòn*ia* argyrostígma.
Begòn*ia* *u*lmifòlia.
Bráss*ia* maculàta.
Caprària lanceolàta.
Ceropègia aphýlla.
*Cybídium stapel*iòìdes.*
Diáscia Bergi*àna.*
Eucalýptus longifòlia.
*Ferràr*ia* pusílla.
Fúchs*ia* excorticàta.
Geodòrum píctum.
Gesnèr*ia* bulbòsa.
*Heím*ia* *s*alicifòlia.
Hornemánn*ia* ovàta.
**Jaboròsa* runcinàta.
*Lantàna Sellow*iàna.*
*Lobèl*ia* cuneifòlia.
Macrógyne convallariæfòlia.
**M*álva anomàla.
Manùlea angustifòlia.
Manùlea tomentòsa.
*Márica longifòlia.
Melaleùca canéscens.
Mesembriánthemum fràgrans.
Mesembriánthemum Sálm*ii.*
Nicándr*a* anomàla.
Pàssiflòra díscolor.
Rhipsàlis salicorniòìdes.
**S*copària flàva.
**S*ìda inæquàlis.
**S*ìda *r*òsea.
Solándr*a* viridiflòra.

PART III.

MISCELLANEOUS INTELLIGENCE.

Art. I. *Natural History in Foreign Countries.*

FRANCE.

Electro-Attraction of Leaves.—The influence of electricity on organised nature, both animal and vegetable, appears to be progressively better understood. The state of the atmospheric electricity is well known to exert a very marked influence on man, in respect of health and disease; and it is a considerable step in the explanation of the sources of this, which has been ascertained, if not discovered, by M. Astier. His experiments have led him to conclude that the leaves, the hairs, the thorns, &c., of plants, tend to maintain in them the requisite proportion of electricity; and, by drawing off from the atmosphere what is superabundant, that they also act in some measure as thunder-rods and paragrêles. In one of his experiments, M. Astier insulated the thorns of growing plants; and, upon being exposed to the atmosphere when the electrical equilibrium was disturbed, they distinctly affected the electrometer. (*Bulletin des Sciences Naturelles.*)

Evaporation on Mountains. — It has been ascertained by the experiments of M. van Marum, that vapours are more largely exhaled from the summits of lofty mountains than from the plains below, in consequence, it is supposed, of the diminution of atmospheric pressure. (*Descript. des Appareils in Bul. Un.*)

Propagation of Oysters, &c. — M. S. G. Luroth has made some severe remarks on the paper on this subject, in a recent volume of the *Philosophical Transactions*, by Sir Everard Home, whom he accuses of superficiality, want of novelty, and, worst of all, gross inaccuracy and credulity. In the points upon which he differs from other naturalists, Sir Everard is farther accused by M. Luroth of not having examined the descriptions previously published, contenting himself with his own very incomplete explanation of the excellent figures of Bauer. MM. Bojanus and Blainville would have set him right as to what he erroneously terms the oviduct in the Anodonton, had he taken the trouble to consult their writings. (*Bulletin des Sciences Nat.*)

Australasian Botany. — M. J. B. A. Guillemin is publishing lithographical figures of the rarer plants of Australasia, under the auspices of M. Benj. Delessert. The first two decades contain figures of 20 plants, described, but not figured, by Brown, in his *Pródromus Flòræ Nòvæ Hollándiæ*. The plates are accompanied by Brown's generic and specific characters, and other explanatory letter-press. (*Bul. Un.*)

GERMANY.

Systematic Arrangement of Acarides. — M. Heyden has undertaken the very difficult task of arranging the family of acarides, or mites, a group of animals which are frequently most important to be understood by the rural cultivator as well as by the naturalist. M. Heyden divides them into 69 genera, the greater part of them new. It would be well if the author would give specific descriptions, accompanied by good figures, of each of these genera. (*Oken's Isis.*)

Posthumous Works of Lyonnet.—The anatomical treatise of M. Lyonnet, on the caterpillar of the Cóssus lignipérda, has, from the period of its publication, 70 years ago, been considered as a production quite unrivalled for minute and accurate research. The second part of this work was announced during the life of the author; but, at his death, the publication of it was stopped. Our scientific friends will, therefore, rejoice to learn, that not only this second part, corrected by Lyonnet himself, but also his researches on the anatomy and metamorphosis of different species of insects, is about to appear at Leyden, under the auspices of Dr. de Hann, the Conservateur of the Royal Museum of Natural History. (*Revue Bibliograph. des Pays-Bas.*)

ITALY.

Prize in Natural History.—The Academy of Sciences of Turin propose to give a prize, consisting of a gold medal, worth 600 livres, for the best work, general or particular, upon the natural history of the states of the king of Sardinia. The works may be either in Italian, Latin, or French, in MS. or printed and published at Turin before the 28th February, 1829. Memoirs, designs, specimens, &c., to be addressed, postage-free, to the Academy of Sciences. (*Journal de Savoie.*)

Ornithology of Tuscany.—Dr. Savi, Professor of Natural History at Pisa, is publishing an important work on the birds of Tuscany, entitled *Ornitologia Toscana.* The work is ably composed, and contains many original observations. The author, however, has fallen into the mistake of being too prone to interfere with established arrangements. He has, in this way, extended the genus Sýlvia, already too numerous, and divided it into nine families, among which we find *M*érula and *T*úrdus! (*Bul. Un.*)

SWITZERLAND.

Fishes.—The late celebrated Prof. Jurine was for many years employed upon a natural history of the fishes of the lake of Geneva, which has just been published from his MSS., with figures engraved under his direction; not as a separate work, however, but in the third volume of the *Memoirs of the Society of Physics and Natural History of Geneva.* It is, like all the author's productions, distinguished for originality and accurate science; and, from the similarity between the Swiss fishes and our own, it well merits the attention of our British ichthyologists.

Another work on the same subject, but comprehending all the fishes of Switzerland, has just been published at Zurich, by M. G. L. Hartman, and is entitled *Helvetische Ichthyologie.* (*Bul. Un.*)

SWEDEN.

Notice of certain rare Plants in the North of Sweden.—M. Lestudius has described, in continuation of a former memoir, a number of rare plants found by him in Lappmark, the mountains of Pitea, &c. Among these we find *R*anúnculus alpéstris, *H*ieràcium fuliginòsum, *S*axífraga maculàta, *S.* glabràta, &c. (*Kongl. Vetens Kaps-Acad. Handlingar in Annales des Sciences Naturelles.*)

Birds of Passage.—M. Eckstrœm has published an interesting paper on Swedish birds of passage, with tables of their arrival and departure from Sœdermonland, kept from 1811 to 1825. The birds which arrive in autumn, and depart in spring, are, *F*ringílla linària, Pàrus caudàtus, *P*yrrhùla vulgàris, *A'*mpelis gárrula, Lànius excùbitor, and Emberìza nivàlis. He mentions the curious fact of some migratory birds, at one time common, becoming rare, or entirely disappearing; and others, which had previously been scarce, arriving in great numbers. (*Ibid.*)

M. Magnus von Wright has given very interesting tables of the arrival of migratory birds in Finland, distinguishing between Abo and Haminaulax, 50 miles farther north. It would be interesting to compare these tables with those which have been made out of British migratory birds. (*Ibid.*)

RUSSIA.

Formation of the Embryo in the Grasses. — M. Trinius of St. Petersburg, is engaged in a keen controversy with M. Raspail of Paris, on the embryo of the grasses; in consequence, it would appear, of some remarks made by the latter in the *Bulletin des Sciences,* on the dissertation of M. Trinius, *De Graminibus uni et sesquifloris.* The disputants have shown much botanical erudition, but the subject does not admit of abridgment in a notice. Those who are interested in it, will find the chief contested points detailed in the *Bulletin des Sciences Naturelles pour Février.*

Scientific Journey. — Professor Hanstein has set out on a journey to Siberia, accompanied by Lieutenant Due of the navy, and at St. Petersburgh they met Dr. Erman, from Berlin, who will go with them as naturalist and astronomer. They will proceed from St. Petersburgh to Moscow, Kasan, and Tobolsk, and northwards along the Obi to Boresow, in order to examine the hitherto imperfectly known northernmost branch of the Ural chain, and to observe the temperature of that tract. They will afterwards go from Tobolsk by way of Tara, Tomsk, Krasnoiarsk, and Nischnei-Udinsk, to Irkoutsk, where they hope to arrive in time to pass the winter. Hence they mean to travel north-east to Jakoutsk, from which the most fatiguing part of the journey will be to Schotsk, as there are 1014 wersts (676 miles) to go over, in a country entirely uninhabited, in which they must pass a thousand streams, bivouac in the night, and take provisions for the whole journey. It is calculated that the tour may occupy two years. The grand object of this important expedition is to observe the phenomena of magnetism, and to ascertain, if possible, the situation of the magnetic poles, &c. (*New Monthly Magazine,* August, 1828.)

NETHERLANDS.

An enormous Whale. — M. Kessels, naturalist at Ghent, has just enriched the cabinet of natural history there with the skeleton of an enormous whale. This specimen is 95 ft. long by 18 ft. high. When dissected, 20,000 kilogrammes of blubber and 63,000 kilogrammes of flesh were cut away. M. Kessels has succeeded in preserving the tail, with the skin, blubber, and flesh undisturbed: it is 22 ft. round the edge. In the opinion of many naturalists, amongst whom is M. Cuvier, this fish could not have been less than 900 or 1000 years old. (*New Monthly Magazine,* No. xcii. p. 357.)

NORTH AMERICA.

Floating Island. — From the earliest times, there are to be found in authors, notices of the singular geological phenomena of floating islands. Pliny tell us of the floating islands of the Lago de Bassanello, near Rome; in Loch Lomond, in Scotland, there is or was a floating island; and in the lake of Derwent Water, in Cumberland, such islands appear and disappear at indefinite periods. Mr. A. Pettingal, jun., has recently described a floating island, about a mile southwards of Newbury port, 140 poles in length, and 120 in breadth. It is covered with trees; and in summer, when dry weather is long continued, it descends to the bottom of the lake. (*American Journal of Science.*)

Port Royal Cássia. — At a meeting of the Jamaica Society for the Encouragement of Agriculture and other Arts, held in the early part of the present year, a paper by Dr. Bancroft was read, concerning a species of Cássia growing wild on the sands near Port Royal, which has long been used by the inhabitants of that town instead of *Sénna*, and which Professor Swartz had described, in 1791, under the name of Cássia *Sénna*, but expressing a doubt of its being the same with the Cássia *Sénna* of botanists. The uncertainty, however, that has existed until lately, concerning the plants that yield the senna of commerce, had prevented the doubt of Swartz from being cleared up. Fresh and dried specimens of the plant were produced, and various omissions and differences were pointed out between these and the description of Swartz; and proofs adduced to show that the Port Royal Cássia is a very distinct species from Cássia obovàta, commonly called *Sénna* itálica, to which it had been referred by some botanists. It was also stated to be essentially different from any of the species of Cássia described by systematic authors, particularly by Decandolle, in the second volume of his *Pródromus*, whose enumeration, comprehending 211 species, is the most recent, complete, and scientific; whence it seemed probable that it was to be considered as a nondescript. A full description of its botanical characters was accordingly given, and it was proposed to designate it by the name of Cássia pòrturegàlis (intimating its native place), and its specific characters were recorded. Proofs were given of its being equally active with common *Sénna;* its taste is, besides, less disagreeable, and it seems, moreover, to possess the advantage of causing much less griping; as a proof of which, it was mentioned that mothers of families were in the habit of giving it to their children, even to infants, in the form of tea, with milk and sugar, and without any ginger or spice as a corrective. It had been supposed that it would not grow in any place but the sands near Port Royal; a fine specimen, however, was produced, that had grown in Kingston, which rendered it probable that it might be cultivated in the low lands, at least, of this island; and the ready sale which a mild yet active *Sénna*, such as this, was likely to meet with in the markets of Europe, afforded encouragement towards attempting to raise it by cultivation here. — *Y.B. April*, 1818.

Botanic Garden at the Havannah. — This is a new establishment, said to be finely laid out, and though not yet finished, to contain many curious plants and trees. On passing some low bushes in a wet situation, the attention of Mr. Bullock was attracted by the singular carved or embossed appearance of the leaves; but on endeavouring to reach one, to examine it, he was greatly surprised at the ornaments disappearing in an instant, and discovering that the appearance was occasioned by a numerous family of beautiful little frogs, which had attached themselves to the foliage, and on his approach had leaped into the water. (*Bul. Mex.*, vol. i. p. 233.)

The Ascent of Popocatapetl, by Lieutenant William Glennie, R. N. — The ascent commenced during the month of April 1827, from the village of Ameca, situated in the province of Puebla, and near the N.W. foot of the volcano, at an elevation of 8216 ft. above the level of the sea, and distant 14 leagues from Mexico.

The author describes the sides of the mountain as thickly wooded with forests of pines, extending to the height of near 12,693 ft., beyond which altitude vegetation ceased entirely. The ground consisted of loose black sand of considerable depth, on which numerous fragments of basalt and pumice-stone were dispersed. At a greater elevation, several projecting ridges, composed of loose fragments of basalt, arranged one above another, and overhanging precipices 600 or 700 ft. deep, presented formidable impediments to the author's progress; and, in one direction only, a ravine was observed to pass through these ridges, having its surface covered with loose black sand, down which fragments of rocks ejected from the crater continually descended.

After twelve hours of incessant fatigue the author gained the highest point of the mountain on the western side of the crater, 17,884 ft. above the sea; at which station the mercury in the barometer subsided to 15·65 in., and the temperature indicated by the attached and detached thermometers, was, respectively, 39° and 33° Fahr. at 5 o'clock P.M., when exposed to the direct rays of the sun. The plain of Mexico was enveloped in a thick haze, and the only distant objects visible at that time, were the volcanoes of Orizaba and Iztaccihuatl. The crater of Popocatapetl appeared to extend one mile in diameter, and its edges, of unequal thickness, descended towards the east. The interior walls consisted of masses of rock arranged perpendicularly, and marked by numerous vertical channels, in many places filled with black sand. Four horizontal circles of rock, differently coloured, were also noticed within the crater; and from the edges of the latter, as well as from its perpendicular walls, several small columns of vapour arose smelling strongly of sulphur. The noise was incessant, resembling that heard at a short distance from the sea shore during a storm; and at intervals of two or three minutes the sound increased, followed by an eruption of stones of various dimensions; the smaller were projected into the ravine before mentioned, the larger fell again within the crater.

The sensations experienced by the author were analogous to those usually felt by travellers at considerable elevations; viz. weariness, difficult respiration, and headache, the latter inconvenience having been first perceived at a height of 16,895 ft. Tobacco smoke and spirituous liquors were also found to produce an unusually rapid effect upon the sensorium. (*Proceedings of the Geological Society of London*, 1827–28. No. vii. p. 76.)

SOUTH AMERICA.


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The Biscacho, or Coquimbo Owl (*Strìx cuniculària*). (*fig.* 150.) —This bird, Captain Head observes, is found all over the plains of the Pampas. Like rabbits, they live in holes, which are in groups in every direction, and which make galloping over these plains very dangerous. These animals are never seen in the day; but, as soon as the lower limb of the sun reaches the horizon, they are seen issuing from their holes in all directions, which are scattered in groups like little villages all over the Pampas. The biscachos, when full-grown, are nearly as large as badgers, but their head resembles a rabbit's, except that they have large bushy whiskers. In the evening they sit outside their holes, and they all appear to be moralising. They are the most serious-looking animals I ever saw; and even the young ones are grey-headed, have mustachios, and look thoughtful and grave. In the daytime, their holes are always guarded by two little owls, who are never an instant away from their posts. As one gallops by these owls they always stand looking at the stranger, and then at each other, moving their old-fashioned heads in a manner which is quite ridiculous, until one rushes by them, when fear gets the better of their dignified looks, and they both run into the biscacho's hole. (*Head's Rough Notes*, p. 82.)

ASIA.

An immense Medusa, a species of sea serpent, was thrown on shore near Bombay in 1819. It was about 40 ft. long, and must have weighed many tons. A violent gale of wind threw it high above the reach of ordinary tides; in which situation it took nine months to rot; during which process travellers were obliged to change the direction of the road for nearly a quarter of a mile, to avoid the offensive effluvia. It rotted so completely, that not a vestige of bone remained. (*C. Telfair, Esq. to R. Barclay, Esq., of Bury Hill*, in *Jam. Journ.*, April, p. 406.)

Hairy Man of Ava. — There is here a man covered from head to foot with hair, whose history is not less remarkable than that of the celebrated porcupine man, who excited so much curiosity in England and other parts of Europe nearly a century ago. The hair on the face of this singular being, the ears included, is shaggy, and about eight inches long: on the breast and shoulders it is from four to five. It is singular that the teeth of this individual are defective in number, the molares, or grinders, being entirely wanting. This person is a native of the Shan country, or Lao, and from the banks of the upper portion of the Saluen, or Martaban River; he was presented to the king of Ava as a curiosity, by the prince of that country. At Ava he married a Burmese woman, by whom he has two daughters; the eldest resembles her mother, the youngest is covered with hair, like her father, only that it is white, or fair, whereas his is now brown or black, having, however, been fair when a child, like that of the infant. With the exceptions mentioned, both the father and his child are perfectly well formed, and, indeed, for the Burman race, rather handsome. The whole family were sent by the king to the residence of the mission, where drawings and descriptions of them were taken. (*Crawford's Mission to Ava.*)

Himalaya Mountains. — Captain Gerard, in exploring these mountains, with a view to measurement, had ascended to the height of 19,600 ft., being 400 ft. higher than Humboldt had ascended on the Andes. The latter part of Captain Gerard's ascent, for about two miles, was on an inclined plane of 42°, a nearer approach to the perpendicular than Humboldt conceived it possible to climb for any distance together. (*Heber's India.*)

A Volcano has burst forth at Bakon in Persia, producing a column of red fire, without smell, of extraordinary height, which burned for three hours, and then sunk to about 2 ft., covering a surface about 600 ft. by 400 ft. At the end of twenty-four hours it had nearly ceased to burn, and will probably become extinguished without leaving any crater. (*Athenæum.*)

AFRICA.

Abyssinia. — The celebrated traveller, Edward Ruppel, is on the point of setting out for Abyssinia, with the intention of exploring those parts which have not hitherto been visited by any European. The senate of Frankfort, by a unanimous resolution, has granted him a thousand florins of annual income for the ensuing seven or eight years, as well in acknowledgement of his former services, as to enable him, agreeably to his wish, to continue his scientific travels and researches. (*New Monthly Magazine*, August, 1828.)

Art. II. *Natural History in London.*

Medico-Botanical Society, *June* 13.—A collection of 5000 specimens of indigenous and exotic plants was presented by Professor Frost, various books by other members, and a considerable collection of grasses by Thomas Gibbs, Esq. A letter was read from the East India Company, informing the Society that the Court of Directors had granted them duplicates of all the medical plants in their extensive herbarium. A letter was read from

His Majesty the King of Bavaria, announcing that the collection which His Majesty had ordered was, through the care of Professor Martius, now ready, and would be delivered to the Society in a short time by the Bavarian ambassador in London, Baron de Cetto. The collection was said to consist of upwards of 600 specimens. Mr. Frost, the Professor of Botany, then delivered a lecture on the genus *Laúrus*, a splendid collection of which was exhibited to the members, there being no less than eighteen living species from His Majesty's gardens at Kew, furnished by the kindness of W. T. Aiton, Esq. Besides these, there were thirteen other species, contributed by Messrs. Loddiges of Hackney, Mr. Richard Forrest, Mr. David Cameron, Mr. Fairbairn, and Mr. Richardson. This genus is particularly rich, as it is from it that many valuable medicines are procured, such as camphor (*Laúrus Cámphora*), cinnamon (*Laúrus C*innamòmum), sassafras (*Laúrus Sássafras*), bastard cinnamon (*Laúrus C*ássia), &c.

A complete bowl of camphor was exhibited, as also several other pharmaceutical preparations from Mr. Battley.

The Chairman announced that a vacancy had occurred in the Professorship of Materia Medica; candidates for which were requested to send in their testimonials as early as possible, as the vacancy would be filled up at the ensuing Meeting.

The Chairman announced that the first fasciculus of the first volume of the *Transactions* of the Society, illustrated with two coloured engravings of the Melaleùca *Cajupùti* and Melaleùca Leucadéndron, was now ready for delivery to the members.

The Committee also announced that a paper, on the doubtful identity of Bonplánd*ia* trifoliàta and Angostura Bark, by Dr. John Hancock, would be laid before the next Meeting, to be holden July 11. 1828. (*Athenæum.*)

July 11. The Society held their last Meeting for the season. After a number of presents were announced, and several gentlemen balloted for and elected, a paper was read, entitled *Remarks on the doubtful identity of Bonplánd*ia *trifoliàta, and the Angostùra or Carony Bark Tree*, by Dr. John Hancock. The paper was accompanied by fine native specimens of the bark, leaves, flowers, capsules, and seeds of the plant.

*A Dog-faced Baboon, S*ímia Hamàdryas (*hamadrỳades*, nymphs who preside over trees, and are said to live and die with them, from *hama*, with, *drys*, the oak), (*fig.* 151.) died a week or two ago in the Tower, after having attracted a great deal of attention during its residence in that establishment, by its extraordinary resemblance to humanity, not only in form and appearance, but also in its manners and habits. The right arm, in particular, exhibited a singular likeness to the corresponding part of the human figure; so much so, indeed, that had it not been for its hairy covering, and the somewhat unusual length of the fingers, the eye, at least, might almost have mistaken it for a portion of some brawny blacksmith, or hero of the ring. Our deceased friend, we understand, used, at all events, to brandish his pot of porter by its assistance, in a style that would have done honour to any of us; and would swill it off, apparently with quite a human relish.

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His attentions to a dog that used to be a frequent visitor at his cage, were, we are told, in the very best style of dignified patronising; nor did the little favourite seem to recognise any difference between the pat of his brother quadruped's paw, and that of the whiter-skinned and shorter-fingered animal. This jolly tippler, however, "life's idle business o'er," sunk at last under a confirmed dropsy, the effect, we fear, of his plentiful potations, leaving only the memory of his fate as a warning to all surviving debauchees. (*Verulam*, No. ii. p. 164.)

The Head of a Hippopotamus has recently been brought to England, with all the flesh about it, in a high state of preservation. This amphibious animal was harpooned while in combat with a crocodile, in a lake in the interior of Africa. The head measures near four feet long, and eight feet in circumference; the jaws open two feet wide, and the cutting-teeth, of which it has four in each jaw, are above a foot long, and four inches in circumference. Its ears are not bigger than a terrier's, and are much about the same shape. This formidable and terrific creature, when full-grown, measures about 17 ft. long from the extremity of the snout to the insertion of the tail, above 16 ft. in circumference round the body, and stands above 7 ft. high. It runs with astonishing swiftness for its great bulk, at the bottom of lakes and rivers, but not with as much ease on land. When excited, it puts forth its full strength, which is prodigious. "I have seen," says a mariner, as we find it in Dampier, "one of these animals open its jaws, and seizing a boat between its teeth, at once bite and sink it to the bottom. I have seen it on another occasion place itself under one of our boats, and rising under it, overset it, with six men who were in it, but who, however, happily received no other injury." At one time it was not uncommon in the Nile, but now it is no where to be found in that river, except above the cataracts. The head is intended as a present to His Majesty. — *M. C. March* 24.

The Trunk of a Walnut Tree, 12 ft. in diameter, hollowed out and furnished as a sitting-room, has lately been imported from America, and exhibited in London. A printed paper, delivered to spectators, states the tree to have been "unparalleled in size and beauty," the trunk 80 ft. high, without a branch, and the entire height 150 ft. The bark was 12 in. thick, and the branches from 3 to 4 ft. in diameter. It grew at the junction of the Silver and Walnut creeks, on the south shore of Lake Erie, in the state of New York. — *Id.*

Evils produced by the Birdcatchers in the Vicinity of London. — Sir, It is well known that the gardens in and about London are much more injured by insects, than those in comparatively distant parts of the country. This, in my opinion, is very much owing to the smaller number of insectivorous birds in and about the metropolis; and the reason there are so few of these is not, as frequently alleged, owing to the smoke, the number of houses, and the want of trees and food, because it is well known that every kind of bird will live and thrive in cages in the heart of London, but to the number of birdcatchers, and, in some respects, to the cats. The cats, perhaps, cannot so well be got rid of, on account of their utility within doors; but I am persuaded that if the legislature would pass an act to prevent birdcatchers from exercising their art within twenty miles of the metropolis, the number of birds would soon be speedily increased, and the number of insects in gardens diminished. Neither ought wild birds of any kind to be shot, or otherwise caught or destroyed, within this distance, under certain penalties; and the result would be a great increase in their numbers, great tameness and familiarity with man, great facilities of studying their habits, and a powerful accession of enjoyment to the lovers of ornithology and natural song. Kensington Gardens, Regent's Park, Greenwich Park, and all the squares and the gardens of suburban cottages, would then resound with the notes of the nightingale, the blackbird, the thrush, and probably the canary. — *J. B*, *Fulham, May* 5.

Bolètus (*bòlos*, a mass; globular form). — The curious deformed fungus which I send you (*fig.* 152.) grew for ten years on the oak tree whence it was taken. Unlike others of the genus, it is not a solitary, but an aggregated or branched production, hence its irregular shape, which would well justify its being called *medusæfórmis*. The pores are not circular as in the common *B*olètus, but oval; and this, it is thought, is a distinction, which separates it from its family, or, at least, is sufficient to mark it a subdivision thereof. Notwithstanding this genus seems to be one of the lowest of vegetable productions, and apparently one of the most useless to mankind, yet some of them have been applied to useful purposes; as the *B.* igniàrius, which is used as a styptic, and also for tinder; and, in all probability, qualities may lie hidden in their uninviting forms, which future analysts have yet to discover. — *J. A. Botanic Garden, Chelsea, February,* 1828.

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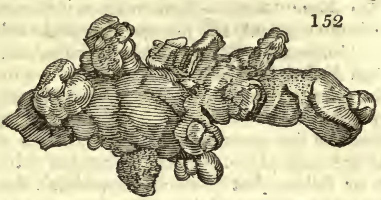

Art. III. *Natural History in the English Counties.*

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Fritilla'ria tessellàta. (*fig.* 153.) — Last spring I saw this plant very abundant in some meadows near Harleston, Norfolk. — *D. S. Bungay, August.*

Hull Literary and Philosophical Society, April 25. — The last Meeting of this Society now took place, and Dr. Alderson being in the chair, Mr. Northen, one of the secretaries, delivered a lecture on the new and interesting science of electro-magnetism, or the relations which subsist between magnetism and electricity. Dr. Alderson announced that, next session, he should produce a paper on the migratory habits of the swallow. He gave this notice, that other members might direct their attention to the subject, and intimated that such a practice might be beneficial to the Society. Mr. W. H. Dikes, the curator, announced that several specimens of fish, with the jaws of a shark, had been presented by Captain Rossindale. Other presents have also been lately made to the Institution, including two lambs (stuffed), one with two bodies joined together at the neck, by Mr. Brownlow; and the other with two heads and six legs, by Mr. Stickney, of Ridgmont. A king parrot [?], from New South Wales, has also been presented by Mr. Parker, and a male and female brook ouzel, or water rail, Rállus aquáticus *Lin.*, Grallæ (*fig* 154.), which were in the recently-printed list of desiderata, by Mr. T. Thompson. The water rail has grey wings, spotted with brown; flanks spotted with white; bill, orange beneath. It inhabits watery places in Europe and Asia; is 1 ft. long; hides itself among the sedges; runs and swims with celerity, but flies heavily, with its legs hanging down. Eggs yellowish, with dusky-brown spots.

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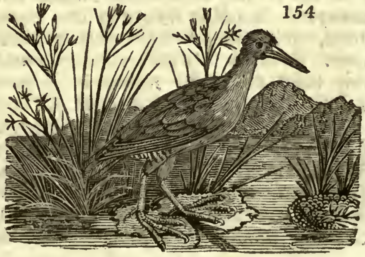
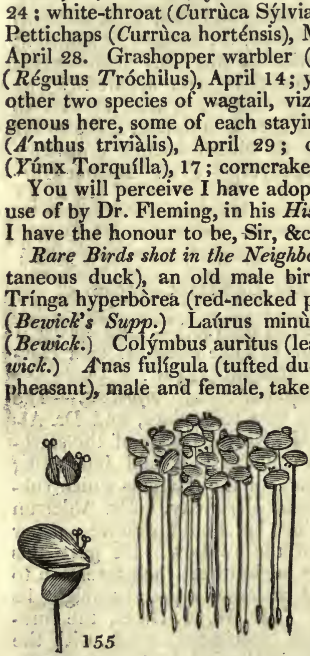


Arrival of the Summer Birds of Passage, in the Neighbourhood of Carlisle, in the Year 1808. — Sand marten (*H*irúndo ripària), April 4.; swallow (*H*irúndo rústica), 18; marten (*H*irúndo úrbica), 28; swift (Pypsètus *A*'pus), 29. Goat-sucker (*C*aprimúlgus europæ'us), May 3. Pied flycatcher (Muscicàpa Atricapílla), April 27. I have no doubt the pied flycatcher arrived before the 27th of April, but it being a scarce species, and the situation it frequents at some distance, I had not an opportunity of visiting the locality before the day above named; it was seen on the 14th of April, last year, near the same place. Spotted flycatcher (Muscicàpa gaísila), May 14. Wheatear, or fallow-chat (Saxícola vendùtie), April 19; whin-chat (Saxícola rubètra), 27; redstart (Sýlvia *P*hœnicùrus), 17; black-cap (*C*urrùca Atricapílla), 24; white-throat (*C*urrùca Sýlvia), 27; wood-wren (*C*urrùca sibillàtrix), 29. Pettichaps (*C*urrùca horténsis), May 8. Sedge-warbler (*C*urrùca salicàrica), April 28. Grashopper warbler (*C*urrùca locustélla), May 1. Yellow wren (*R*égulus *T*róchilus), April 14; yellow wagtail (*M*otacílla flàva), 14. The other two species of wagtail, viz. *M.* álba and *M.* boarula, are both indigenous here, some of each staying the whole year. Field-lark, or titling (*A*'nthus triviàlis), April 29; cuckoo (Cùculus canòrus), 23; wryneck (*Y*únx Torquílla), 17; corncrake, or land rail (*O*rtygomètra Créx), 20.

You will perceive I have adopted the generic and specific names made use of by Dr. Fleming, in his *History of British Animals* recently published. I have the honour to be, Sir, &c. — *T. C. Heysham. Carlisle, June* 5. 1828.

Rare Birds shot in the Neighbourhood of Yarmouth. — *A*'nas nyràca (castaneous duck), an old male bird, taken May 20. (*Bewick's Supplement.*) Trínga hyperbòrea (red-necked phalarope), male, taken first week in June. (*Bewick's Supp.*) Laúrus minùtus (least gull), male, taken in February. (*Bewick.*) Colýmbus auritus (least-eared grebe), male, taken in May. (*Bewick.*) *A*'nas fulígula (tufted duck), male and female. *A*'nas glaciàlis (sea pheasant), male and female, taken in February. (*Bewick.*) A'lca álce (little auk), male. (*Bewick.*) Two rare birds, called the Kentish or Alexandrian Plover, but of which I cannot strictly give a correct name or reference, and a fine specimen of the Procellària Leách*ii*, were taken here a short time since: the last is a very rare bird. (*Temminck.*) — *T. W. S. June* 20. 1828.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Lémna mìnor (the lesser duck's-meat) (*fig.* 155.) *and màjor* (*fig.* 156.) are very abundant in the ditches in this neighbourhood; but I never saw any of the species in flower till the other day, when I found almost every plant of *L*émna mìnor in blossom. — *D. Stock. Bungay, June* 11. 1828.


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In the vicinity of London, *L*émna mìnor may always be found in flower in the beginning of June, and *L*émna trisúlca, rather later, is not rare. *L.* màjor (*L.* polyrrhìza of authors) has not been found in flower in England, and *L.* gíbba but seldom. — *J. D. C. S.*

Rare Insects found in Huntingdonshire. — The following insects, among many others, were found by myself and W. S. Gray, Esq., of St. John's College, Cambridge, at Monk's Wood, Sawtry, Huntingdonshire, on the 16th, 17th, and 18th of last June, viz. Pìcris *C*ratæ'gi, Melitæ'a A'rtemi*s*, Sapérda lineàto-cóllis and *p*opúlneus, Leptùra

6-maculàta, Libéllula 4-maculàta, and L. depréssa, Adèla degeerélla, Thýmel*e* alvèolus *Steph.*, Chrysomèla gráminis, Circòpis sanguinolénta. The Apatùra I'ris was found in plenty in the larva state, in the same wood, at the beginning of June. — *C. C. Babington.* 7. *Hanover Street, Bath, July* 8. 1828.

Art. IV. *Natural History in Scotland.*

Wernerian Society. — *Feb.* 23. 1828. Read. Notice regarding a living Ocelot, or *F*èlis *P*árdalis, from South America, communicated by James Wilson, Esq.: the animal was a female, nearly of full size, had been almost two years at Liverpool, and had lately been transferred to the menagerie of the Zoological Society in the Regent's Park. The second part of Dr. R. E. Grant's account of the Anatomy of the Perameles nasùta of New South Wales, treating particularly of the organs of generation.

March 8. Read. Notice of the wasting effects of the Sea, which have exposed a submarine forest on the shores of Cheshire, between the rivers Mersey and Dee; by Robert Stevenson, Esq., civil engineer. Two memoirs; 1. on the Mines of the Higher Pyrenees; 2. on the Marbles of the Higher Pyrenees. On the Forked Hake of Pennant, which had been cast ashore near St. Andrew's in a storm; by the Rev. John Macvicar, A.M.: a drawing of the fish, by Mr. Macvicar, was also exhibited. On keeping entire the crystals of efflorescent and also of deliquescent Salts, by means of surrounding them with an atmosphere formed from an essential oil, such as oil of turpentine; by Mr. Deuchar.

March 22. Read. On the great fish that swallowed up Jonah, showing that it could not be a whale, as often supposed, but was probably a *S*quàlus *C*archàrias, or white shark; by the Rev. Dr. Scot, of Corstorphine. At this Meeting was also read the first part of a memoir on the Lunar Compass, &c.; by Mark Watt, Esq.

April 5. Read. Remainder of the paper on the Lunar Compass; by Mr. Mark Watt. Memoir on the shefifon of Moses (Gen. xlix. 17.), or the adder of the English translators; by the Rev. Dr. Scot. Notice of the great Oak of Cowthorpe, in Yorkshire, illustrated by a drawing; by Thomas Johnson, Esq.

The Plinian Society. — Since the dissolution of the Natural History Society in 1812, till the Plinian Society was founded in the year 1823, no simiiar institution existed in Edinburgh, whose principal object was the advancement of natural history. The Wernerian Society is not taken into account, as it occupies a different station from the Plinian Society, among the scientific institutions of Scotland. The progress which had been made in the study of this science, and the zeal which was manifested for its promotion by the students of the University, seemed at that period to warrant the hope that the formation of such a society would be attended with success; and, accordingly, nearly forty members were enrolled during the first year of its existence. The principal intention of the founders of the Plinian Society was to promote natural history; but antiquarian researches, and the advancement of all the physical sciences, have also been included amongst its professed objects. The means which have been adopted for the prosecution of the views of the Society are, the reading of papers, debates, the formation of a museum and library, and excursions to the country, for the examination and collection of objects of natural history. Papers have been read on subjects connected with all the departments of natural science, more especially on the zoology, botany, geology, mineralogy, meteorology, and antiquities of Scotland. The library is now extensive, and contains many of the modern standard works connected with the sciences which the Society cultivates. The museum has made great progress and now contains a considerable collection of quadrupeds, birds, reptiles, insects, shells, &c.; a numerous general collection of plants, and also a remarkably complete herbarium of Scotland; a valuable collection of simple minerals, amounting to 500 specimens, a very perfect series of rocks, and more particularly a collection illustrative of the geological structure of Scotland; and a collection of coins, antiquarian relics, &c. It will be unnecessary to remark on the flourishing state of this Society, when it is stated that it is at present composed of upwards of 180 members. [For the above communication we are indebted to Thomas Torrie, Esq., who has obligingly added an abstract of the proceedings of this Society, from Nov. 1827 to June 1828, which, we regret, want of room obliges us to defer till a future opportunity.]

New or rare Plants which have flowered in the Neighbourhood of Edinburgh, and chiefly in the royal botanic garden, during the last three months, communicated to *Jameson's Phil. Jour.*, for June 1828, by Dr. Graham: Begòn*ia* dipétala, B. papillòsa, Cattlèy*a* intermèdia, Conqspérmum *e*ricifòlium, *D*ràba grácilis, Eriostèmon *s*alicifòlius, *H*edýsarum nùtans, *I*ris lutéscens, Nicot*iàna* glaúca, and *P*olýgala paucifòlia.

Art. V. *Perennial Calendar for various Parts of Europe.*

We now insert the remainder of the form which we intend our correspondents to fill up. We should wish to receive, before the 1st of October, all the criticisms on this form, intended to be sent us, in order that we may be able to make our final corrections, in time to distribute the skeleton letters to our correspondents at the different stations, by the 1st of November. We are still in want of correspondents for several of the stations, and we should be glad to add to those of Europe as many as we can in America.

We consider that the register of this skeleton calendar in this Magazine, even if we should never be able to get it filled up to our satisfaction, will tend to the advancement of meteorological science; for, by enabling various persons in different countries of Europe and America, to direct their attention to the same plants and animals, when at any future period their observations are made public, through whatever channel, they will admit of a more accurate and useful comparison than has hitherto been made. Thus many men, in different places and in different lands, may be silently, and unknown to each other, cooperating, in well-directed efforts, to attain the same object.

Skeleton Perennial Calendar, continued from p. 193.

Flora for March. — Plants came in flower, viz. the daffodil on the , crocus , polyanthus , primrose , almond , apricot on walls , chickweed , wall speedwell , violet , tulip , green hellebore , narcissus , common heath , dandelion , marigold , heart's ease , dog's violet , pilewort , wood sorrel , dog's mercury , checkered lily , and field turnip on the . Trees flower, viz. the gooseberry on the , Lombardy poplar , ash ; and horsechestnut and balsam poplar begin to shoot on the .

Fauna. — Rooks and jackdaws build on the , redbreast on the , chit-chat, or middle willow wren, heard on the , frogs croak , peacock screams , owls hoot , green woodpecker laughs , spiders appear , bees come forth , whinchat arrives , smallest willow wren arrives , stone curlew calls , nuthatch chatters , blackbird sings , missel or storm-thrush in full song , geese lay , wasps and humble bees appear , bats fly , and great argus and peacock butterflies are seen on the .

Meteorology.—As before, adding equinoctial gales commenced , continued days.

Flora for April. — Guelder rose on the , corn poppy , elder , yellow flag , common pink , hedge-nettle , fraxinella , wood sorrel , buttercup , wallflower , tulip , hyacinth , jonquille , archangel , crown imperial , grape hyacinth , blackthorn , great saxifrage , dog's-tooth violet , stitchwort , cowslip , stock , and male orchis ; in leaf, the gooseberry , horsechestnut , larch , sycamore , and lilac . Fruit trees came into flower, the cherry on the , the apple , pear , and the raspberry on the .

Fauna. — Arrived the smallest willow wren on the , black-cap , redstart , swallow , house marten , black marten, or swift , sand marten , field lark , nightingale , white-throat , lesser white-throat , Dartford warbler , cuckoo , wryneck , grasshopper lark , turtle-dove , orange-tip butterfly , tortoise-shell butterfly , black May fly ; young pigeons on the , goslings , and young redbreasts , and vipers bask on the .

Meteorology. — As before.

Flora for May. — Field hyacinth, or blue-bell, flowered on the , gentianella , oxlip , globeflower , yellow rattle , red azalea , thrift , yellow azalea , herb Robert , laburnum , Guelder rose , mock orange , peony , hawthorn , Solomon's seal , germander speedwell , lilac , columbine , lily of the valley , and horse-chestnut on the . Trees came in leaf, viz. poplar on the , willow , alder , elm , oak , ash , and mulberry on the . Early peas gathered on the , and cauliflowers on the .

Fauna. — Land rail heard on the , cockchaffer, or May beetle, appears , dragon-fly , glowworm , golden rosechaffer , white angler's fly , gad-fly , stag-beetle , goat-sucker , ring ouzel , fly-catcher , turtle-dove , nightingale , and stone-curlew .

Meteorology. — As before.

Flora for June. — The elder on the , corn poppy , Guelder rose , yellow flag , common pink , hedge-nettle , fraxinella , larkspur , white orchis , spiderwort , lady's slipper , moss rose , red centaury , hop , sweetwilliam , sword lily , spiked speedwell , woodroof , pyramidal campanula , flos Jovis , foxglove , scarlet lychnis , white lily , evening primrose , lilac , laburnum , sunflower , and American cowslip on the . Trees in leaf, viz. the mulberry on the , and the platanus not till the . Fruits ripe: the strawberry on the , cherry , and gooseberry on the . Hay-harvest begins: saintfoin on the , clover , meadow on the .

Fauna.— Bees swarm on the , land rail heard , cockchaffer, or May beetle, appears , dragon-fly (L. depréssa), turtle-dove , flycatcher , yellow lark , goatsucker , glowworm , wasp , rose beetle , nightingale , stone curlew , midsummer beetle , angler's white fly , admiral butterfly , comma butterfly , young swallows fly , and largest willow wren on the .

Meteorology.—As before, and add thunder storms.

Flora for July.—Evening primrose on the , fraxinella , lady's slipper , moss rose , sword lily , woodroof , hop , foxglove , white lily , American cowslip , scarlet lychnis , martagon , stramonium , houseleek , orpine , water plantain , tulip tree , deadly nightshade , carnation , tiger lily , sunflower , African marigold , hollyhock , cardinal flower , love-lies-bleeding , and French marigold . Fruits ripened, viz. gooseberries , currants , cherries , jargonelle pear , juneating apple , apricots , strawberries , raspberries , and black currants on the . Harvest begins: peas ripe on the , rye , wheat .

Fauna.— Young martens fly on the , partridges run , dragon-fly (L. grándis) appears on the , midsummer beetle , admiral butterfly , glowworm , nightingale silent , cuckoo silent , young frogs leave the water .

Meteorology. — As before, and add thunder storms.

Flora for August.—Carnations flowered on the , hollyhock , passion flower , coreopsis , meadow saffron , tobacco , ragwort , China aster , rudbeckia , lady's traces , Chrysánthemum índicum , perennial sunflower , and buck wheat . Fruit ripe, viz. morello cherry , noblesse peach , elruge nectarine , green gage plum , magnum-bonum plum , Windsor pear , mulberry , white fig . Harvest begins: peas , wheat , oats , rye , barley . Corn harvest ends .

Fauna.—Swift, or black marten, disappears on the , starlings congregate , house sparrows repair to the fields .

Meteorology. — As before.

Flora for September.—Autumnal crocus on the , China aster , golden rod , amellus aster , small-flowered aster , large purple aster , Jerusalem artichoke , fine-leaved wormwood , dahlia . Leaves of trees begin to change colour, viz. the lime on the , elm , horsechestnut , beech , willow , and ash leaves begin to fall on the . The noblesse peach ripened on the , elruge nectarine , green gage plum , Windsor pear , mulberry , and white fig not till the ; filberts , walnuts , chestnuts , and hops on the .

Fauna.—Swallows congregate on the , martens .

Meteorology.—As before, and add, equinoctial gales commenced on the , continued days.

Flora for October.— Chrysánthemum índicum began flowering on the , late-flowering golden rod , ivy , China aster , and arbutus on the ; abele and ash shed their leaves on the ; field beans cut , buckwheat ripe , and swans-egg pear ripe the .

Fauna.—Woodcocks arrive on the , redwings and fieldfares on the ; ring ouzel on the ; swallows migrate on the , house and sand martens on the .

Meteorology.—As before.

Flora for November.—Arbutus began to flower on the , laurustine on the .

Fauna.—Woodcocks appeared on the , snipes on the , fieldfares and redwings on the , snow bird , aberdavine on the , and trout repair to their spawning places on the .

Meteorology.—As before.

Flora for December.—Christmas rose showed flower on the , sweet coltsfoot on the , arbutus , and winter aconites on the .

Fauna.—Wild ducks appear on the , nuthatch chatters , aberdavines appear on the , trout spawn , snowbirds (or snowflakes) seen , common wren sings , hedge sparrow sings , lambs drop .

Meteorology.—As before.

Observations.—Should any of the particulars mentioned under heads Flora, Fauna, in the respective months, happen either before or after the times they are here expected to occur, such may be noticed in the observations under each month. Under the head Meteorology, it is particularly necessary that not only the commencement and duration of the equinoctial gales be marked, but also any decided change of weather, as thunder-storms, floods, &c.; in order that contemporary changes at distant stations may be more easily accounted for.

Art. VI. *Calendar of Nature for London.*

June.—*Flora.* Wheat came into flower on the 16th, the white lily on the 22d, and the evening primrose on the 28th.

Fauna. Young wasps appeared on the 20th; the geometric-web-making spider (*A*rànea geométrica) on the 25th. About the same time the little moths, the larva of which had been so destructive to the foliage of many plants, particularly apple trees and white-thorn hedges, came forth from their chrysalis state. They prove to be the *P*halæ'na pyràlis of Linnæus, and very much resemble the common small moth so destructive to woollen garments and house furniture. The eggs of these insects, it is probable, were deposited on the branches near the buds the preceding autumn, or early during the very mild spring.

July.—*Flora.* It was near the end of the month before the sunflower, hollyhock, and dahlia presented their conspicuous flowers. On the 21st the large horse-mushroom (*A*gáricus campéstris var.) was sold in the streets. Except for catsup, this species of mushroom should be cautiously eaten. In wet seasons, or if produced on wet ground, it is very deleterious, if used in any great quantity.

Fauna. The nightingale silent on the 1st; the processional moth appears on the 3d, laying its eggs, in connected cylinders, round the twigs of apple or blackthorn trees; vast numbers of the *I*chneùmon peregrinàtor fly, with their long, vibrating, clouded antennæ, in gardens, in search of dormant insects, or places where larva are, on which to lay their eggs, about the 3d; hoary beetle (*S*carabæ'us solstitiàlis *Lin.*) seen on the 9th; hair worm (Górdius aquática *Lin.*), plentiful on moist ground, on the 10th. About this time the skylark, black-cap, reed and sedge warblers, are the principal song-birds heard. Harvest-men (*P*halángium Opílio *Lin.*) appear on the 17th, and the carrion beetle (Sílpha 4-punctàta) on the 28th. This last insect may be seen on evenings hovering under hedges, or in thick woods, in search of dead animals, on which it preys and breeds; colour black, with two belts of yellow across each shell. A dead mole seems to be its favourite repast.

August. — *Flora.* Many of what are called "the solstitial wreath of the goddess of flowers" are still in beauty; to which there are added dahlias, hollyhocks, convolvuli, and all the new splendid varieties of Œnothèra, Nicotiàna, &c., in the gardens. In the fields, and on wastes, foxgloves, toadflax, chiccory, &c., are the most striking flowers.

Fauna. Our song-birds are almost all silent. The black-cap has not been heard during the last week. A song-thrush, and now and then a sky-lark, may occasionally be heard; but the general harmony of the woods is over. Swifts appear to be directing their flight to the south-westward, the wet season urging their departure. Insects do not appear to be so plentiful as they are in dry summers; the common lady-bird (Coccinélla 7-punctàta *Lin.*) is even rare about London this year, but the C. 2-punctàtæ are numerous; neither are aphides so prevalent as they sometimes are.

The weather, for the last two months, has only been a continuation of that which preceded. Unfortunately for the country, but few places have escaped heavy and unseasonable rains; causing floods, and much damage to the crops. There must be a particular reason for this weather, which the "Perennial Calendar," kept at a sufficient number of points, will be one of the most certain means of developing. — *J. M. Chelsea, August* 15.

Art. VII. *Indicatorial Calendar.*

During the next two months, naturalists are on the alert for insects; and the stag, fox, hare, badger, otter, marten, and polecat, are pursued by sportsmen.

Birds.—The pheasant, moorcock, ptarmigan, heathcock, mountain-cock, partridge, quail, woodcock, and land rail, are all the immediate objects of the sportsman's attention; besides all the water birds which come within range of his barrel. Even the heavy bustard would not escape, did not its own timidity keep it afar from the paths of man. Of birds which migrate to other countries, the time of their leaving is the only circumstance worth notice. The greater number depart in September; the swallow generally about the 10th of October; and the house and sand martens about eight days later, according to the warmth of weather.

Insects. — The following, among others, may be met with: Coccinélla 12-punctàta; *P*apílio Machào*n* and Vanéss*a u*rticæ butterflies. Sphínx *c*onvólvuli (the convolvulus hawk moth) and *S*phínx A'tropo*s* (the death's head moth). Also, the Tórtrix tripunctàta, and the harvest bugs, Stomóxys cálcitrans and írritans, may be both seen and felt. Some or all of these may also be met with in October; and, in addition, the Nóctua exolèta (the large sword-grass moth), the Geómetra connectària (the connecting umber), and the *T*ínea gelatélla (the autumnal dagger moth).

The Sea and Fresh-water Fish which will be in the London market during the next two months, are nearly such as were named for June and July, with the addition of cod and herrings.

Astronomical Remarks. — Two of the superior planets are now particularly attractive on evenings, soon after sunset; viz. Jupiter in the south, and Mars in the south-east, part of the heavens. The moon will be with them; and the other planets, in the course of the two next months, on the days and times following: —

September 5. at	11 A.M. Saturn.		October 2. at	11 P.M. Saturn.
5.	3 P.M. Venus.		4.	9 P.M. Venus.
9.	2 P.M. Mercury.		10.	8 P.M. Mercury.
13.	6 P.M. Jupiter.		11.	11 A.M. Jupiter.
13.	11 A.M. Mars.		16.	8 P.M. Mars.
			30.	10 A.M. Saturn.

August 15. 1828. J. M.

Art. VIII. *Queries and Answers.*

A Call and Answer from some kind of Bird.—Travelling through a marshy district of Galloway a few evenings ago, my attention was called to a strange sound in the air, resembling the bleating of a goat. The evening was serene, and remarkably fine for the climate and season of the year, with beautiful moonlight; but still I could see no object from which the sound could proceed. It seemed first to arise from the marsh, and, rising higher and higher in the air, was sometimes overhead, and on each side of me, and appeared to be a call and answer from some kind of bird. It was not, indeed, so sweet as I have heard the song of the nightingale in the south, but, associated as it was with the fineness of the evening, was far from disagreeable. On enquiry, I am informed that such sounds are always heard about this season; and that they proceed from the male and female birds of what is provincially called the "Heather-blite." Pray what is it? — *J. N. Cally Gardens, April* 4. 1828.

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This must have been either the Curwillet (*Charàdrius calìdris Lin.*) (*fig.* 157.), or the Whimbrel (*Scólopax* phæ`opus). (*fig.* 158.) The *Charàdrius*, or Plover, belongs to the Linnean order of birds, Grállæ, the character of which is, bill subcylindric, a little obtuse; tongue entire, fleshy; legs naked above the knees. The generic character of *Charàdrius* is, bill roundish, obtuse, straight; nostrils linear; feet formed for running, 3-toed. The specific character of *C.* calìdris, the Sanderling, or Curwillet, is, bill and legs black; lores (see *fig.* 55. *b*, in p. 123.) and rump greyish; body beneath white without spots. It inhabits the sandy shores of Europe and America, and is 8 in. long. The *Scólopax* belongs to the same Linnean order, and includes the different species of curlew, snipe, and woodcock. The generic character is, bill roundish obtuse, longer than the head; nostrils linear; face covered; feet 4-toed, hind toe consisting of many points. The specific character of *S.* phæ`opus (*phaios*, dark, *ōps*, face; black beak) is, bill arched, black; legs bluish; back with rhomboid brown spots; rump white. Inhabits Europe and America, and is 1 ft. long.— *J. M.*

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Preserving Specimens of Plants. — Sir, In your reply to the Rev. G. Munford's request (p. 196.) for directions on the subject of forming a herbarium, you very properly begin by speaking of the method of preserving the specimens, which, of course, is almost the first step in the business. Having, by experience, found great advantage from the easy method which I myself adopt for this purpose, and not knowing whether the same may be generally known or practised, I venture to recommend it to Mr. Munford and to others, through the medium of your Magazine. The great principle to be attended to is, to *dry the specimens thoroughly and quickly.* Accordingly, it has more than once been remarked to me by others, that plants which have been dried in hot climates, usually retain the largest share of their original brilliancy and beauty; and I have myself found that such specimens as I have gathered in the course of a tour, and, for want of other conveniences, have merely placed between the leaves of a memorandum-book, or the like, and carried in the pocket, have, owing to the warmth of the pocket, been better preserved than others more leisurely dried in the ordinary way. It is owing to the same cause that I have been able to select from a rick of hay that had been well got, and had properly heated, specimens that would not disgrace a respectable herbarium. Let the specimens, then, be gathered, if possible, when quite dry, and never, on any account, put in water, with a view to keep them fresh, after they are gathered, and previously to their being pressed between paper; a practice which would tend to increase the quantity of moisture in the plants, and, consequently, add to the difficulty of drying them. Then take some leaves of coarse blotting-paper, the more bibulous the better, and heat them at the fire, till they become as hot as they can be made without scorching them. Place the specimens separately between two of these leaves, so heated; lay them between boards or other flat surfaces, and press them with a heavy weight. This process of heating the paper, and shifting the specimens, should be often repeated, twice, or, at least, once a day, till the juices of the plant are evaporated. In this manner the specimens, if not very robust or succulent ones, will generally be sufficiently dried in the course of a week, or even in less time. The advantages of this method are, not only that the specimens will be thoroughly dried in a short time, and therefore will be less liable to become mouldy or to decay, but also that they will generally retain the colour, both of the flowers and leaves, much more perfectly than when preserved by means of a slower process, and without the aid of artificial heat. A few years ago, a Swiss botanist of the name of Thomas, visited this country, bringing over with him extensive collections of dried alpine plants for sale. That eminent naturalist A. H. Haworth, Esq., was so struck with the beauty of these specimens, many of which retained the vividness of their colours almost as perfectly as when they were in a living state, that he was induced to ask M. Thomas what means he adopted in their preservation. Without making any mystery of the art, M. Thomas readily communicated to him the above-mentioned process of heating the paper; and it is to the kindness of my friend Mr. Haworth that I am indebted for the knowledge of it. — *W. T. Bree. Allesley Rectory, July* 9. 1828.

Preserving Specimens of Natural History. — Information on this subject being requested by T. A. of Portsmouth, G. H. Ludlow, R. V. of Cork, and W. I., till some correspondent favour us with details, we beg to recommend *Taxidermy, or the Art of Collecting, Preparing, and Mounting, Objects of Natural History, for the Use of Museums and Travellers.* London. 8vo, pls. 3d edit. 7*s*. Our valued correspondent Mrs. Bowdich contributed largely to this work, and was enabled to explain the different methods, by attending at the laboratory in the Jardin du Roi at Paris. The appendix to Mr. Waterton's *Wanderings,* a book which every naturalist ought to read, contains some original and valuable information on preserving birds, and we intend to abridge it in a future Number.

Skulls of Brutes. — Can you, or any of your correspondents, inform me whether or not the skulls of brutes are in two tables, in the manner of those of the human race? — *C. May*, 1828.

The human Voice. — I have been always wont to regard the human voice, with its inflections and the various other phenomena of speech, as one of the most distinctive and wonderful things which belong to human nature; and I have always been proportionally curious to know what is most particularly wanting in the throats and lungs of the higher classes of animals, especially those which approach nearest to ourselves, that hinders them from imitating us, and that makes even the most docile of them unteachable in this way. Why beasts *do not* speak the language of man, is not the question I would propose, but why (as is evident) they cannot. Whether it is owing, to use a musical phrase, to their want of ear; whether, to use a philosophical one, it results from their want of understanding; or whether, as I am apt to think, it arises from the want of a proper conformation of the organs most necessary in speaking? Now, if any of your correspondents could be induced to favour me with a little comparative anatomy or reasoning, which would go to the elucidation of this point, I am sure it could not fail of being interesting to many of your readers, but particularly to your correspondent. — *Id.*

Starwort, as a Remedy for sickly Bees. — Sir, Grahame, in his *British Georgics*, p. 126., describes a plant, under the name of "starwort," as a remedy for sickly bees. Our "husbandmen" do not seem to be acquainted with the herb, nor is my knowledge of botany extensive enough to enable me to determine what it is. I shall, therefore, feel obliged to any correspondent who can give me its botanical name; and the obligation will be much increased if he can also inform me that experience has confirmed its healing virtues. That it is *not* the "starwort" of botanists, the appended description will sufficiently show: —

"In meadows grows a flower, by husbandmen
Called *starwort;* easily it may be known,
For, springing from a single root, it spreads
A foliage affluent, golden-hued itself,
While, from the leaves of darkest violet,
An under-tint of lighter purple shines:
Harsh to the taste, it wrings the shepherd's mouth:
Its root in wine infused, affords at once
The hapless sufferers medicine and food."

An Apiarian. Berwick, May 31.

The Glowworm. — Sir, In the review of *Murray's Researches in Natural History*, in the last Number of your Magazine, I find the following passage concerning the glowworm, Lampy̆ris noctilŭca (from *nox*, night, *lucus*, a light; and not from *noctiluca*, a candle, as in the review): — "Their light, which they have power to extinguish at pleasure, proceeds from brilliant spots on the three last rings of the body, under the tail; the luminous matter is a yellow substance, contained in vesicles, and when these vesicles are removed entire, they shine for some time afterwards, but if lacerated they are extinguished." This passage brought to my recollection a circumstance which is probably not worth relating, but which interested me; it might be from my ignorance of the subject. I was, with a large party, returning at a late hour of the night, from Richmond theatre, to Ham, when we observed a number of glowworms in the path: their unusual number engaged our attention, and a young lady stooping to take up one in her hand, observed that she had hurt it, and passed on. Two of us stayed to look at the wounded worm, which had become exceedingly luminous; we traced its passage on the earth, by a train of light yet more vivid than its unbroken lamp, and still extending in length. I do not, at this distance of time, remember whether we were one minute, or two, or three, but we continued watching it, until afraid of being quite distanced by the rest of the party. It was very unwillingly that we left it, while its light was yet burning and increasing; the worm had moved in a circular direction, and the ring of light (I think about 1 ft. in diameter), was very nearly completed; we wished to have seen it quite completed, and what direction it would next take. The light had become somewhat fainter towards the beginning of the track, and its continuity was broken in two or three places. This light proceeded, I suppose, from the yellow substance discharged from the wounded vesicles, and the interruptions were caused by the partial drying up of that substance; but what occasioned so extraordinary an expansion of light, together with an increased brilliancy? This, and its circular direction excited my attention and interest. I have no knowledge of entomology, and am very likely speaking of a mere common-place; in this case, you may please to make my communication more luminous than you find it: should you insert it in your Magazine, some of your readers may be disposed, through the same medium, to enlighten, Sir, yours, — *A. A.*

Orobánche minor. — Is Orobánche mìnor a parasitical plant? In the clover fields in this neighbourhood, where it abounds, it does not appear to be attached to any other plant; but in my garden, this year, I had several plants, and the roots were so firmly attached to those of Prenánthes muràlis, that it was impossible to separate them, without destroying the fibres of their respective roots. — *D. Stock. Bungay, July* 28. 1828.

The Worm of Corruption. — In a narrative in the *Times* newspaper of July 28., of the disinterment of the body of the patriot Hampden, in Hampden church, Buckinghamshire, in July, 1828, and where it had been buried in June, 1643, it is stated that "the skull was in some places perfectly bare, whilst in others the skin remained nearly entire, upon which we discovered a number of maggots and small red worms on the feed with great activity. This was the only spot where any symptoms of life were apparent, as if the brain contained a vital principle within it which engendered its own destruction; otherwise how can we account, after a lapse of nearly two centuries, for finding living creatures preying upon the seat of intellect, when they were nowhere else to be found,—in no other part of the body?" Can you, or any of your correspondents, throw any light on this subject? What are the names of the insects or worms? Do the maggots ever become winged insects? and if so, how do they escape? Or do they die in the larva or in the chrysalis state? How do their eggs get there? and if there before the body was deposited, how does it happen that they remain so many years before being hatched, seeing the nidus must have been equally favourable for hatching at any one period during the last 150 years at least? — *S. T. July* 29. 1828.

The Red and White Lýchnis dioíca. — Sir James Smith much wished to find a distinction between the Red and White *Lýchnis* dioíca. I have observed the pistils to be much larger in the latter, and I would ask if the stigmas have ever been found revolute. — *W. H., R.N. Yeovil, August* 5. 1828.

Knowledge of Fossils. — I beg to be informed of the best plan of obtaining a knowledge of fossils. To myself, and, probably, to many of your readers, a description of the genus and order to which they belong, and in what formation they are to be found, if accompanied by engravings similar to those that adorn your work, would be highly acceptable to others as well as to, Sir, yours, &c. — *Vectis. Isle of Wight, Aug.* 2. 1828.

Rearing young Pheasants. — I should be obliged if any of your correspondents could inform me of the best mode of rearing young pheasants, as I find, after having attempted to rear some for two seasons, that they die off very suddenly as they are throwing out their crop and tail feathers, without any appearance of being any way sick or affected. I feed them very plentifully on ants and their eggs, as well as on other insects, and they are kept on a grass-plot, and removed daily. — *Id.*

Górdius aquáticus. — I have now in my possession a Górdius aquáticus *Linn.*, which was pumped up a few months ago, from a well, near Knutsford in Cheshire. It is about 7 in. in length, and of the thickness of a pin; the body is smooth, and of equal dimensions throughout; the colour is dark brown, with black at the extremities. It lived for three or four weeks subsequent to its being in my possession, during which time it was kept in a vessel of water; but I was at a loss how to afford it any nourishment beyond what it might derive from the water; and, after the time I mention had elapsed, it became weaker, performed none of those surprising twists and convolutions which had distinguished the earlier part of its captivity; and I at last put it into a bottle containing spirits. There seemed no difference, that I could discover (at least with any magnifying powers I used), between the head and tail of the animal. It manifested no particular inclination or disinclination for clay, when introduced into the vessel, though I find some authors assert that it makes a habitation of it at certain seasons. I should be glad to hear from some of your correspondents, who are acquainted with the habits and mode of living of the Górdius, some more particulars on the subject, through the medium of your valuable journal. — *H.*

Art. IX. *Retrospective Criticism.*

The least Woodpecker not rare near Coventry. — At p. 83. of your Magazine an extract is given from the *Tyne Mercury*, stating that a fine specimen of the least woodpecker (Pícus mínor) was shot in the neighbourhood of Newcastle; and it is added, that this is "*perhaps the only specimen known to be British.*" The bird is by no means of very rare occurrence in this neighbourhood (Warwickshire). Twice, within this last fortnight only, have I gone out of the house to listen to it, having been attracted by its well-known and amusing noise. It is, indeed, a bird more readily heard than seen. Its diminutive size and shy habits are perhaps among the causes of its being supposed by some to be a rarer species than it really is. Its loud, rapid, vibratory noise, most extraordinarily loud to be produced by so small an animal, can hardly fail to arrest the attention of the most unobserving ear. Though I have watched the bird during the operation, and within the distance of a few yards, I am quite at a loss to account for the manner in which the noise is produced. It resembles that made by the boring of a large auger through the hardest wood; and hence the country people sometimes call the bird the "pump-borer." — *W. T. Bree. Allesley Rectory, near Coventry, May* 23. 1828.

The Vignette on the Cover. — When I received your Magazine of Natural History, my eyes were first attracted by the picturesque outside of the book, and I found the selection of the individuals of the vignette, which I may call the "coat of arms" of naturalists, well adapted to the work. But I have a great objection to the composition of the subjects, which many of your readers, and you yourself, perhaps, may regard as trifling. That composition, however, by a nearer contemplation of the objects, assumes a more serious appearance; for the picture, I presume, is made on purpose to give at first sight a correct idea of the contents of the book. How offensive, therefore, to the eye of the connoiseur, to see that the composition of the drawing is quite incorrect, and how much must it diminish the real merit of the work, to see that the Conductor of the Magazine of Natural History makes such a blunder against nature, and seems not to combine knowledge of zoology with that of geographical botany!

My objection is, that the lion and the elephant, which, as every body knows, are natives of a hot climate, rest under the gloomy branches of an old fir, indigenous to the coldest north, and that the eagle, the owl, and the chamois, inhabitants of cold, woody, and rocky countries, are sheltered by lofty palms. This, in my opinion, is an unpardonable fault against nature.

The picture would, therefore, appear much more correct if the individuals had been drawn under their native trees, and it would, at all events, improve at least the outside of your truly valuable Magazine. (*W. H. A Lover of Nature.*)

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This is perfectly fair criticism; but that the geographical error in question does not proceed from ignorance will appear by referring to our original prospectus, criticised by Z. B., in No. I. p. 94., an impression of which we here introduce. (*fig.* 159.) How in the improved cut the eagle came to be transferred from under the fir or cedar, to under the palm, was owing to the employment of two artists, one for the animals, and another for the trees, &c., in making a new drawing, and this drawing was engraved before we had an opportunity of seeing it. A corrected and improved vignette has been in progress for some time, and, if not ready for this Number, it will certainly be so in time for the titlepage of the volume. We sincerely thank W. H. for his criticism; it would have been easy to have made the correction and said nothing about it, but we have introduced his letter at length, because we wish to show our young readers, that, in looking at even so small a matter as an ornamental vignette, there is a great difference in the number and kind of ideas which arise in the mind of a man of general knowledge and taste, and those which present themselves to a mind, which to this general knowledge and taste has added the science specifically belonging to the subjects inspected. — *Cond.*

Superstition relating to Bees. — On further enquiry, I find that the superstitious practice, which I formerly mentioned, of informing the bees of a death that takes place in a family, is very well known, and still prevails among the lower orders in this country. The disastrous consequence to be apprehended from noncompliance with this strange custom, I now understand to be, not (as before stated) that the bees will desert the hive, but that they will dwindle and die. The manner of communicating the intelligence to the little community, with due form and ceremony, I am told is this: to take the key of the house, and knock with it three times against the hive, telling the inmates, at the same time, that their master or mistress, &c., (as the case may be) is dead! — *W. T. Bree. Allesley Rectory, July* 9. 1828.

Psalm-singing to Bees. — When in Bedfordshire lately, we were informed of an old man who sang a psalm last year in front of some hives which were not doing well, but which he said would thrive in consequence of that ceremony. Our informant could not state whether this was a local or individual superstition. — *Cond.*

Translation and Derivation of Technical Terms. — Sir, I am surprised to see you found fault with by your correspondent *A.* (p. 200.), for giving the derivations of technical words, enclosed between parentheses, in the body of the page. It will be admitted, I suppose, by all, that it is both useful and agreeable to know the meaning of the words we employ. Many of the technical terms of science are not always immediately obvious, even to those who have a knowledge of Latin and Greek; and to such as do not possess that advantage, the words in question, unless they are explained, must generally be downright hard words without meaning, and, as such, prove impediments to the acquisition of knowledge. It may often happen, too, that when a word is fully known as to its bare etymology, still the *drift and propriety of its application* to the particular plant or animal to which it belongs may be far from apparent, till pointed out. In defence of your own practice, you very justly say that "the translations and derivations are likely to have the best chance of being remembered, when given where they occur." Might you not go further, and say that in this way they have not only the best chance of being *remembered*, but the best chance of being *known*, or even *read at all?* Whatever inconvenience may arise to the reader, from the introduction of these parentheses in the body of the page (and I do not deny that some slight interruption is hereby occasioned), still, the inconvenience complained of appears to me quite trifling, compared with that of being continually obliged to turn to a glossary at the end of the Number to find the meaning of a word; and rather than submit to such a disagreeable interruption, your readers, I suspect, will be content, oftentimes at least, to remain in ignorance of the meaning of many a technical word they meet with. I should not have troubled you on this subject, were it not that you say, "If other readers are of the same opinion as your correspondent *A.*, you shall relinquish the practice." Now, I do hope, Sir, that, for the reasons given above, you will not relinquish the practice, but continue the same plan with which you have commenced. At the same time I wish to observe that an index or glossary of translations and derivations introduced, as you propose, at the end of the volume, will be of the greatest utility and advantage, for the purpose of ready reference at any time it may be required. — *B. Coventry, July* 12.

Having received several letters on this subject, all highly approving of the plan which we have hitherto adopted, we intend persevering in that plan. — *Cond.*

Ignis Fatuus. — If I may be allowed to remark on the review of *Murray's Researches*, &c. (p. 156.), I would observe that I can certify the existence of the ignis fatuus, and also that it appears "as a glow of lambent flame." Two of these phenomena made their appearance on the evening of the 26th of October, 1823, on board the Sandwich packet, on our passage from the West Indies to England, when about 200 miles north of the Bahamas, and remained, one at the spindle of each mast-head, for about two hours; the atmosphere being in a very unsettled state, with rain and lightning. The one at the main-mast-head was rather brighter than the other, and, before disappearing, occasionally passed up and down the upper part of the mast, but never entirely disengaging itself, notwithstanding the heavy motion of the vessel.

On "*the luminosity of the sea*" I would just say, that its appearance previous to a storm is a very old observation amongst sailors. It is, however, I think, without foundation, as it is to be seen, more or less, all the year round, in the Carribean sea, where there are no storms but in the hurricane months. In the hand it has a kind of mucous feel. — *W. H., R. N., Yeovil. August 5.*

The Spider. — The remarks on the spider, in the review of *Murray's Researches* (p. 157.), were peculiarly interesting to me, as I have often held a leaf in my hand, to which a spider had fixed his line, and have seen the spider floating in the wind, at a great distance, and returning again with surprising velocity. It has often gone to so great a distance, that I have thought the line had broken, and yet he returned again upon this singularly strong and delicate web. One day last week I amused myself for more than an hour in observing the proceedings of a little spider, whose bag of eggs had been removed and restored. I do not feel quite sure as to the species, but, if I can ascertain that, I think it would make an interesting paragraph, to detail what I then observed. — *A. A.*

The late Mr. Sowerby. — At p. 198., I have observed that some well-meaning friend, desirous of doing a service to the memory of my lamented father, in claiming for him his share of the honour due for the execution of that national work the *English Botany*, has rather overshot the mark: Mr. Sowerby was not the author of any part of the text of *English Botany* (erroneously called *English Flora*). The work owed its origin to the circumstance of Mr. Sowerby having made a number of sketches of plants, to be introduced in the foregrounds of landscapes, which he was in the habit of painting from nature. These sketches were shown to various botanical friends, at whose suggestion the work was begun, with the valuable assist- of Sir J. E. Smith; and the only descriptions that were not written by that gentleman, were supplied by the late Dr. Shaw. In addition to the praise due to Mr. Sowerby, for the excellence of the drawings and engravings in that work, some portion is due to him for the spirit of enterprise with which he carried it on; for, although he had to depend upon portrait-painting for the capital required, he still industriously and steadily pursued his expensive project, until it began to remunerate him (which was not for several years), and he finally brought up a numerous family to enjoy its profits, and lament the loss of one of the best of parents. I remain, Sir, &c. — *J. D. C. Sowerby. Museum, Mead-Place, Westminster Road, Aug.* 11. 1828.

THE MAGAZINE

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NATURAL HISTORY.

NOVEMBER, 1828.

Art. I. *On the Metamorphoses of the Reproductive Bodies of some A'lgæ, said to possess successively an Animal and a Vegetable Existence.* By Δ.

One of the most extraordinary opinions now supported by various naturalists, is that which maintains a twofold vitality in a certain class of bodies, or, in other words, both an animal and a vegetable existence. Some very celebrated names have lent their testimony to confirm this opinion, and it is asserted that many of their conclusions are the results of actual experiment. It is true, they do not assert that any individual body is at once both an animal and a vegetable, but they do assert that it passes from an animal to a vegetable state without disorganisation.

"There are phenomena in the kingdom of nature," observes Professor Nees von Esenbeck (as quoted in the *Annales des Sciences Naturelles*), "which can hardly require too frequently repeated experiments, and which, when proved, demand the support of numerous recorded authorities. For, as the phenomena in question appear to contradict certain principles admitted into the reigning systems, we often prefer rather to deny the conclusions of candid and experienced observers, than to receive what has hitherto been regarded as untenable by generally received authority.

"In this situation are placed all observations upon the transition, or metamorphosis, of vegetable life (which is characterised by immobility) into animal life (distinguished by motion); the moment when a being, arrived at the period of its existence, continues itself, as it were, by a new creation, and the animated embryo developes itself into a motionless vegetable."

Among the naturalists who have laboured in this new and singular field, Professor Nees von Esenbeck must be placed foremost on the list, as he was the first to publish his observations, in a distinct manner, in the year 1814. Since that period, Treviranus, Ditmar, Agardh, Bory de Saint-Vincent, Gruithuisen, Carus, Gaillon, Desmazieres, and others, have endeavoured to substantiate the truth of the phenomenon.

The tribe of Oscillatòriæ, forming a part of Agardh's great group of Confervöídeæ, or jointed *A*'lgæ, are well known to have derived their name from the oscillating motion of the filaments. Nothing is more easy than to perceive this motion, and the Oscillatòriæ, consequently, are held in a dubious point of view by all botanists. M. Vaucher, of Geneva, who published a *Histoire des Conferves d'eau douce*, noticed such a difference between the two extremities of the filaments in some species, that he denominates one the head, and the other the tail.

Professor Agardh, of Lund, who has directed his attention chiefly to the *A*'lgæ, published, a few years ago, an ingenious essay upon the metamorphoses of many species. To show how far he has carried his observations, it will be sufficient to mention that, in his *I'cones Algàrum inéditæ*, fasc. 1. t. 10., he has represented the vegetable form of Oscillatòria flexuòsa, and also the animalcules into which the filaments are at length converted.

There can be no doubt, that the colouring matter of the famous red snow (named Protocóccus nivàlis by Agardh), brought from the arctic regions by Captain Ross and Captain Parry, is a true vegetable, belonging to the order *A*'lgæ. It grows upon limestone rocks, tufts of moss, dead leaves, and even on the bare soil. The singularity of the situation, however, in which it was first discovered, that of pure snow, gave rise to speculations regarding its origin. Professor Nees von Esenbeck was inclined to think that the minute red globules, of which the plant consists, were the vegetable state of bodies which had gone through a prior animal existence, and perhaps of atmospheric origin.

Baron Wrangel, who discovered the Protocóccus nivàlis growing upon limestone (without knowing at the time that it was the true red snow), studied it very carefully. He mentions that the red crust was soon detached when placed under water, and a number of much smaller globules, of a yellow or pale colour, made their appearance, of which the larger red globules seemed to be composed. After a lapse of three days the globules became animated, like infusory animalcules; they swam about, and were frequently pursued and devoured by other Infusòria.

It is worthy of remark, that Agardh does not mention having observed any such motion in the globules; neither does Mr. Bauer: and Dr. Greville, who has published a very full history and analysis of the plant in his *Cryptogamic Flora*, did not perceive it. The appearance of vitality, therefore, in this instance, was probably owing to some illusion.

The most precise observations ever made upon this curious subject, are the recent ones by M. Franz Unger, of whose account it may be desirable to give a translation in his own words. In this country, the very idea of such metamorphoses is almost startling; and, at first, will probably be regarded as visionary, and rejected accordingly. I trust, however, the present article will have the effect of inducing a few individuals, at least, to commence a series of observations for themselves.

"I found," says M. Franz Unger, "near Vienna, in a ditch containing some clear water derived from the recent melting of the snow, a Conférva, which, after cleansing from the clay which surrounded it, I deposited in a glass vase, and placed in a window, where I could observe without disturbing it. This was on the 5th of March, 1826. Two days afterwards, I noticed the production of a crowd of new rámuli, several lines in height, and rising from the general mass like a fine green miniature sward. On the 9th, these filaments produced fructification in the form of a darker green globule at their summits, by which I knew my plant to be the Conférva dilatàta var. β of Roth, or the Ectospérma clavàta of Vaucher.

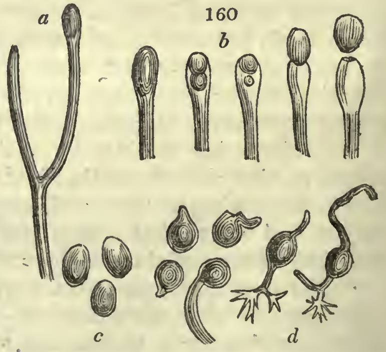
"As I continued my observations, I happened to look at the surface of the water, and was not a little astonished to find it covered, especially towards the side of the vase, with minute globules, unequal both in colour and size. Many of them swam freely here and there, moving, at their option, in one way or another, retiring and approaching one another, gliding round globules that were motionless, stopping, and again setting themselves in motion exactly like animated beings.

"Conjecturing the identity of the green globules that possessed motion with those that had none, I immediately began to examine whence these infusory animalcules derived their origin, and what relation they bore to the green globules and the fructification of the Conférva.

"The next day I perceived a great number of the globules aggregated around the bubbles of gas disengaged from the Conférva, and floating at the surface. They were some of them of a dark green colour, and either round or elongated; others more transparent, tumid, and with one or two appendages diverging from, or at right angles with each other; these were evidently plants in a state of germination: other globules, again, were oval, very dark at one extremity, and almost transparent at the other; these swam about freely.

"Within the space of one hour, I succeeded in tracing not only the diminution of vitality, and death of the Infusòria, but also the subsequent developement of the dead animals into germinating plants, in such a manner as to establish the truth of the fact. But, on the 12th of March, I had the pleasure of ascertaining distinctly the origin of these minute bodies. I undertook to observe, without interruption, one of the tubercles of fructification, which I have already mentioned as terminating the filaments, in order to discover what became of the green matter enclosed within it. I had observed it for the space of half an hour, when the following changes (*fig.* 160. *a b c d*) became perceptible:—

"The globule became gradually darker in its colour, and a little transparent at its extremity; in the middle it was evidently somewhat contracted, and had some trace of spontaneous motion. I could scarcely believe my eyes, when I perceived the contraction to become more decided, and a cavity to be formed at the base. The contraction at length divided the globule into two smaller globules, which moved spontaneously towards the summit. As the developements proceeded, the cavity and the uppermost globule became enlarged, while the inferior globule became diminished. The latter at length disappeared, and the remaining large globule escaped by a terminal orifice, ascending till it reached the surface of the water. The whole of this process occupied about thirty seconds; but, from subsequent observations, it may be stated generally to take up one minute."



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a, The summit of one of the branches of Ectospérma clavàta in fructification.

b, A series of views of the fructifying summit, showing the gradual expulsion of the contained globule.

c, The globules as they appear during their animated state.

d, The globules commencing their vegetable state of existence.

All the figures in the cut are magnified.

M. Franz Unger ascertained, also, that the period of animal existence enjoyed by these globules (or monades, as he calls them) is about one hour. The first sign of this portion of their life having ceased is, a change from the oval to the globular form, and an equal diffusion of the green colouring matter. In about six hours, the globule has become much more transparent, and puts forth an appendage, and on the third day a second one, by which the young plant becomes fixed to the side of the glass vase, or any other body in contact with it. About the eleventh day the fructification of the new plant is apparent at the summit of the principal branch. Δ

Art. II. *The Cuvierian, or Natural, System of Zoology.* Essay 2. *On the Living Principle and its Effects; on Organisation and Muscular Motion; and on Sensation, and the Intellectual Faculties and Instincts of Animals.* By B.

In the preceding essay I selected, from the introduction to Cuvier's *Règne Animal*, his descriptions of those parts of the animal physiology that were necessary to explain the principles on which his four grand divisions of animals, the *vertebrated*, the *molluscous*, the *articulated*, and the *radiated*, are founded. There are other parts of physiology, which, with what has been already given, may be regarded as forming the very rudiments of the natural history of organised sentient beings. These are, for the most part, concisely and luminously described by our author; and I think it desirable to state them to the English reader, before we proceed to his farther description and subdivisions of vertebrated animals.

Without some acquaintance with the leading facts in physiology, we can have no scientific knowledge of zoology, or of the principles on which a natural system of classification should be founded. As well might we expect to learn the mechanism of different timepieces, by a mere inspection of the dial-plates and the cases in which they are enclosed, as to gain a scientific knowledge of living beings, by only looking at their external forms. The principles of a new science, however clearly they may be stated, are never thoroughly understood until a practical application of them has been made. We then turn to them again, and perceive their full force and meaning. This is even the case with the axioms in geometry. I think it necessary to premise these remarks, lest any of our readers should deem this part of the subject less inviting than what is to succeed.

The descriptions of the different classes and orders of animals in the following essays will be illustrated by references to cuts, and such explanations will be added as, I trust, will be generally intelligible.

The definition which Cuvier gives of the living principle is rather a description of its effects than of its essence, which must ever remain an impenetrable mystery. If, says he, we would form a just idea of the essence of life, and observe it in those beings where its effects are the most simple, we shall perceive that it consists in the faculty which certain organised bodies have of existing for a certain time, under a determinate form, by incessantly absorbing into their own composition a part of the surrounding substances, and by giving back to the elements a portion of their own proper substance. Life is, therefore, a more or less complicated agitation or vortex (*tourbillon*), constantly going on in a certain direction, and carrying with it molecules of the same kind, but into which other individual molecules are continually entering or passing out; so that the *form* of the living body is more essential to it than the *matter*. When this vital motion finally ceases, the body dies, and the elements of which it was composed separate and are again subjected to common chemical affinities, and decomposition speedily takes place. Hence, it appears, that the living principle possesses the important power of suspending or changing the laws of chemical affinity; for it was this power that prevented the putrefaction or decomposition of the living body, and united its elementary molecules.

All living bodies die after a period, the extreme term of which is fixed for each species. Death appears to be a necessary effect of life, for the vital motion insensibly changes the bodies in which it acts, so as to render their permanent continuance impossible.

The living body experiences gradual but continual changes during its whole existence. At first it increases in size, according to certain proportions and limits fixed for each species, and for each of its parts. After the parts are full grown, they increase in density. It is this second change which appears to be the cause of natural death.

The process which terminates in what Cuvier describes as natural death, consists not only in the increase of density, but of hardness, and goes on until the fibres and vessels are converted into bone: it is called ossification, and has been well described by Dr. Armstrong: —

> "Life glows meantime amid the grinding force
> Of viscous fluids and elastic tubes;

Its various functions vigorously are plied
By strong machinery; and in solid health
The man confirmed long triumphs o'er disease.
But the full ocean ebbs; there is a point
By nature fixed, whence life must downwards tend;
For still the beating tide consolidates
The stubborn vessels, more reluctant still
To the weak throbs of the ill supported heart.
This languishing, these strengthening by degrees,
To hard, unyielding, unelastic bone.
Through tedious channels the congealing flood
Crawls lazily, and hardly wanders on;
It loiters still, and now it stirs no more.
This is the period few attain, the death
Of nature. Thus (so Heaven ordained it) life
Destroys itself; and could these laws have changed,
Nestor might now the fates of Troy relate,
And Homer live immortal as his song."

Art of Preserving Health, book ii.

To return to our author, all living bodies, he observes, require to have solid parts to preserve the form, and fluid parts to keep up the internal motion. Their texture (*tissu*) is therefore composed of network (*réseaux*) and of plates (*mailles*), or of fibres and solid laminæ (*lames solides*), which enclose liquids in their interstices. It is in the liquids that the vital motion is the most constant and extended. Foreign substances penetrate the intimate structure of the body, by incorporating with the liquids. It is the latter which nourish the solids, by interposing their molecules among them; it is the liquids which also detach the superfluous molecules from the solids; it is under a liquid or gaseous form that the matter, which requires to be exhaled, traverses the pores of the living body; but it is the solids that contain the liquids, and which, by their contractions, communicate to them a part of their motion.

This mutual action of the solids and fluids, this passage of the molecules from one to the other, made a great similarity of chemical composition necessary for both; and, accordingly, we find that the solids of organised bodies, both vegetable and animal, are, in a great part, composed of elements susceptible of taking easily a gaseous or liquid form. The motion of the liquids requiring a continually repeated action of the solids, it was necessary that the solids should possess flexibility and dilation, and this is a nearly general character of organised solids.

This structure, which is common to all living beings, this porous texture (*tissu areolaire*), of which the fibres or laminæ are more or less flexible, and enclose liquids in greater or less abundance, is what is called organisation. No unorganised material bodies can partake of life. Life in general supposes organisation in general, and the proper life of each being supposes an organisation proper for that being. We never observe life but in beings completely organised, and made to enjoy it; and all the efforts of philosophers have not been able to show matter either organising itself, or becoming organised by an exterior cause.

The birth of organised beings is, therefore, the greatest mystery of organic economy, and of all nature. We see them develope themselves, but we never see their formation. All those whose origin we can trace, have belonged at first to a body of the same form as themselves, but developed before them, or, in other words, to a parent. Before the being has individual life, when it partakes that of its parent, it is called a germ; the separation of the germ is what is called *generation.* All organised beings produce their like; without this, death being, as before stated, a necessary consequence of life, the species would become extinct. Organised beings possess, in a variable degree peculiar to each species, the power of reproducing certain parts which may be lost; this is called the power of *reproduction.*

The developement of organised beings is more or less rapid and extended, accordingly as circumstances are more or less favourable to their growth. Temperature, and the abundance or kind of food, may affect either the whole body, or certain parts: hence the resemblance of the progeny to their parents can never be perfect. The differences of this kind form what are called *varieties.*

We have no proof that all the differences which distinguish living beings can ever have been produced by circumstances, as Darwin and others have maintained. Experience appears to show, on the contrary, that, in the present state of the globe, the varieties are comprised in narrow limits; and, as far as we can remount into antiquity, we see that these limits were the same as at present. We are, therefore, obliged to admit the existence of certain forms, which have been perpetuated since the creation (*depuis l'origine des choses*), without exceeding these limits; and all the beings belonging to one of these forms constitute what is called a *species:* the varieties are accidental divisions of the species. According to Cuvier, generation being the only means of knowing the limits to which varieties may extend, a species should be defined *the reunion of all the individuals descended from common parents, and of those which resemble them as much as they resemble each other.*

Cuvier, however, admits that the application of this definition to certain individuals may be very difficult, where necessary experiments have not been made. In few countries have experiments on the different species of domestic animals been more extensively made than in England, and it has been ascertained that almost any accidental variety of form may be perpetuated, by selecting and breeding in succession, for four or five generations, from the individuals that possess it. Thus, several distinct races of horses, sheep, bulls, and pigs, have been formed within the last sixty years, which will remain permanent, if the breeds be preserved from admixture with other varieties; but these breeds do not constitute species.

The functions of organic life, described in the preceding part of this essay, are common to all organised living bodies, whether animal or vegetable: they consist, says Cuvier, of absorption, assimilation, exhalation, growth, and generation. Birth and death are the universal limits of the existence of organised bodies. The essential condition of their structure is a porous or fibrous texture, containing within it (*dans ses mailles*) liquids or gases in motion. The essential parts of their chemical composition consist of substances which are almost all convertible into liquids or gas, and of combinations which can easily change into each other. Fixed forms, which are perpetuated by generation, distinguish their species, and determine the complication of the secondary functions proper to each, and assign to them the part they are destined to perform in the assemblage of universal beings. These forms neither produce nor change themselves; life supposes their existence: it cannot be kindled but in organic bodies completely prepared for its reception; and the most profound meditations, as well as the most delicate observations, terminate in the mystery of the preexistence of germs.

It has been before stated, that the principal chemical elements of which organised bodies are composed are *oxygen*, *hydrogen*, and *carbon*, and that animal bodies contain an additional element, *azote.* In animal bodies there are three forms of organic texture (*tissu*), the cellular (*la cellulosité*), the muscular fibre, and the cerebral or medullary texture.

The cellular texture is composed of an infinite number of minute laminæ, placed without regularity, and forming small cells, which are open to each other. It is a kind of sponge, which has the same form as the whole body, and all the other parts fill it or traverse it. Its property is to contract indefinitely, when the causes which kept it extended cease to act. The cellular texture compressed, forms those more or less extended laminæ called membranes; the membranes, when folded round, form those tubes called vessels, which are more or less ramified; the filaments called fibres may be resolved into the cellular texture; the bones may be regarded as the cellular texture (*la cellulosité*) hardened by the accumulation of earthy substances. The general matter of which the cellular texture is composed is called gelatine; it has the property of dissolving in boiling water, and, by cooling, it forms jelly.

The cerebral or medullary matter has not yet been reduced to its organic molecules *; it appears to the eye as a kind of soft pulp, in which we can only distinguish excessively minute globules. It does not seem susceptible of motion, but it is in this cerebral matter that resides the mysterious and admirable power of transmitting the impressions from the external senses to the mind, and of conveying to the muscles the orders of the will. The brain is principally composed of it; the spinal marrow, and the nerves which are distributed over the body, are, essentially, but bundles (*faisceaux*) or ramifications of the cerebral matter.

The fleshy, or muscular fibre is a particular filament, the distinctive character of which, in a living state, is to contract when touched or struck by another body, or when it experiences, by the intervention of the nerves, the action of the will.

The muscles, which are the immediate organs of voluntary motion, are only bundles of fleshy fibres; all the membranes and vessels which exert a compressive force, are furnished with these fibres; they are always intimately connected with nervous filaments. The substance of the fleshy fibre is *fibrine*, which is indissoluble in boiling water, and its nature appears to be, to take of itself the fibrous form.

The nourishing fluid, or the blood, as it exists in the circulating vessels, may not only be resolved into the general elements of the animal body, carbon, hydrogen, oxygen, and azote, but it already contains fibrine and gelatine, nearly prepared to contract and take the form of membranes or fibres; at least, it only requires a little rest, to manifest these properties. Another combination, called albumen, is easily discovered in the blood; its characteristic property is, to coagulate in

* Since the publication of Çuvier's work several important discoveries have been made in the structure of the brain and nerves, by Spurzheim, Bell, Edwards, and others, from which it would appear that the structure of the medullary matter and nerves is fibrous, and, according to Dr. Edwards, the fibres are composed of minute globules, like the cellular and muscular tissues. It appears, also, that the nerves which convey impressions to the mind, are distinct from those which convey the orders of the will to the muscles.

boiling water. Albumen contains nearly all the elements which can enter into the composition of each animal, as lime and phosphorus, which harden the bones of vertebrated animals, the iron which colours the blood, the fat and animal oil which are disposed in the cellular texture to soften it, &c. All the liquids and solids of the animal body are composed of chemical elements contained in the blood; and it is only by abstracting some of these elements, or by varying the proportions, that they differ from each other; in a few instances, an addition is made of some other element. These operations, by which the blood supports the solid parts of the body, are called nutrition; the production of the liquids is generally called secretion. The blood which nourishes the body, is continually changing its properties; but it is restored by digestion, which furnishes new matter; and by respiration, which discharges the superfluous carbon and hydrogen; while transpiration, and various excretions, carry away other superabundant principles.

The perpetual transformations of chemical composition constitute a condition of vital action, not less essential than the circulation and the internal motions of the parts; indeed, the latter only serve to effect these transformations.

The muscular fibre is the organ of animal motions, both of those which follow the action of the will, and those which are independent of volition, as the peristaltic motion of the intestines, and the pulsation of the heart and arteries. The will causes the muscular fibre to contract, by the intermediate action of the nerves; and, as all the muscular fibres which produce involuntary motions are also accompanied by nerves, it is therefore probable that it is the nerves which produce muscular contraction in the latter.

In order to account for the action of the nerves upon the muscular fibres, Cuvier, with other physiologists, admits the existence of a nervous fluid, which is not, however, like the other fluids of the body, confined in tubes, vessels, or pores, but is imponderable, like heat and electricity, though he supposes it to be secreted by the medullary matter. According to our author, the medullary matter of the brain and nerves is a conductor of the nervous fluid; all the other organic elements are non-conductors, and arrest its progress, in the same manner as glass is a non-conductor of electricity.

Every contraction, and, in general, every change of dimension in nature, is effected (*s'opère*) by a change of chemical composition: sometimes, this is nothing more than the afflux or retreat of an imponderable fluid, such as caloric; by this the most violent motions known on the earth are produced, as combustions, detonations, &c. Hence, Cuvier infers that it is by an imponderable fluid that the nerve acts on the muscular fibre, since it can be demonstrated, that it does not act mechanically. All the external causes that excite sensations, or occasion a contraction of the muscular fibre, are chemical agents, capable of effecting chemical decompositions, as light, caloric, salts, odorous vapours, percussion, compression, &c.: it is therefore probable, he says, that these causes act on the nervous fluid chemically, and change its composition; for their action is weakened (*s'émousse*) by continuance, as if the nervous fluid required to be restored to its primitive state (*composition*), in order to be acted upon again. The internal agents which irritate the muscular fibre, and occasion it to contract, probably produce the same effect upon it by the intervention of the nerves, as is caused by the will. The nervous fluid is changed (*s'altère*) by muscular irritation, as well as by sensation and voluntary motion, and has the same need to have its composition restored. The most important involuntary motions are the peristaltic, or wormlike motion of the intestines, which is excited by the irritation of the aliments, and the pulsation of the heart and arteries, which is excited by the irritation of the blood.

The external organs of the senses are a kind of sieves (*cribles*) that only admit those agents to the nerves, which ought to affect them in each place. Thus the tongue has strong papillæ, which imbibe saline solutions; the ear has a gelatinous pulp, which is agitated by sonorous vibrations; and the eye has transparent lenses, that are only permeable by light. I forbear to follow our author farther in his details of the action of the nervous fluid; for the existence of such a *fluid* may be regarded as hypothetical: the nervous fluid may, however, be admitted as a term, to express the cause of nervous action, though we remain profoundly ignorant of the essence of this cause; the same may be said of the essence of the electric fluid, of caloric, and of light; and it may not be improper to remark, that there are some striking analogies between the nervous action, and electric or galvanic energy, which might induce us to believe that they are modifications of the same principle. Whatever explanation chemical or electric agency may afford, respecting the motions of the nerves or muscles, they entirely fail, when applied to sensation itself. Cuvier justly observes that the impression of external objects on the mind or individual consciousness (*le moi*), the production of a sensation or image, is an impenetrable mystery to the human understanding; and materialism is so far from offering any solution, that philosophy cannot furnish us with any direct proof of the actual existence of matter. We are, however, compelled, by an invariable law of the understanding, to refer the objects which excite our sensations to something out of the mind, existing in time or space, to which we give the name of matter, and the naturalist is bound to examine what appear to be the *material conditions* of sensation.

In order that external objects may be perceived, it is necessary that there should be an uninterrupted nervous communication between the organs of sense, and the central masses of the medullary system; for it is only the modifications of these masses that are perceived by the mind.

There may be real sensations, without any impression on the external organs of sense; these internal sensations originate either in the nerves, or the central medullary mass or brain; such are dreams, visions, and certain accidental sensations. By central masses is to be understood, a part of the nervous system, which is more circumscribed in the more perfect animals; in man it is exclusively confined to a certain portion of the brain, but in reptiles it consists of the brain, and all the medullary matter of each part, taken separately, so that the absence of the whole brain does not destroy sensation; in the lower classes of animals, the medullary mass is far more extended through the parts.

The intellectual faculties possessed in a certain degree by the superior animals are, perception, memory, the association of ideas, imagination, volition, and reasoning. Our author enumerates also the power of abstraction, but it may be doubted whether abstraction can be effected without the aid of signs or language.

One privileged being, man, has the faculty of associating general ideas with particular images, more or less arbitrary, which are easily fixed in the memory, and which serve him to recal the general ideas that they represent. These associated images are what are called signs; collectively they form a language. When language is composed of signs relative to the sense of hearing, it is called speech. When the signs relate to objects of sight, they are called hieroglyphics. Writing is a succession of images relative to the sense of sight, by which we represent the elementary sounds; and, in combining them, we represent all the images relative to the sense of hearing, of which speech is composed. Writing is, therefore, only the mediate representation of ideas.

This faculty of representing general ideas, by signs or images that we associate with them, assists to keep them distinctly in the memory, and to recal an immense series of them without confusion; and furnishes to the reason and the imagination innumerable materials, and to individuals the means of communication, which make all the species participate in the experience of each individual; so that knowledge may be increased indefinitely through the lapse of future ages. This is the distinctive character of the human understanding.

The most perfect animals are infinitely below man in their intellectual faculties; it is, nevertheless, certain that their understanding leads them to perform actions of the same kind. They move in consequence of the sensations they receive; they are susceptible of durable affections; they acquire a certain knowledge of things by experience, according to which they conduct themselves, independently of actual pain and pleasure, by the sole foresight of consequences. In a domestic state, they feel their subordination, and know that the being who punishes them is free to do so or not; they assume a supplicating air when they feel themselves culpable, or perceive that their master is angry. They improve or deteriorate in the society of man; they are susceptible of emulation and jealousy; they have among themselves a natural language, which is, indeed, only the expression of their present sensations, but man teaches them a much more complicated language, by which he makes them know his will, and compels them to execute it.

We perceive, indeed, in the superior animals, a certain degree of reasoning, with all its effects, good or bad, which appears to be nearly the same as that of infants before they have learned to speak. In proportion as we descend to animals more removed from man, the intellectual faculties become weaker; and, in the last classes, they finish, by being reduced to signs of sensibility, which are sometimes equivocal, that is, to certain feeble motions to escape pain. The degrees between the two extremes are infinite. But there exists, in a great number of animals, a faculty different from intelligence, called *instinct*. This makes them perform certain actions, necessary to the preservation of the species, but often altogether foreign to the apparent wants of the individual; and often, also, extremely complicated. We cannot attribute these actions to intelligence, without supposing a degree of foresight and understanding infinitely superior to what we can admit in the species that perform them. The actions performed by instinct are not the effects of imitation, for the individuals that execute them have often never seen them done by others; they bear no proportion to the common intelligence of the species, but become more singular, more skilful, more disinterested, in proportion as the animals belong to the less elevated classes, and are, in other respects, most stupid. They are so much the property of the species, that all the individuals perform them in the same manner, without any improvement.

Thus working bees have, since the beginning of the world, constructed the most ingenious edifices, agreeable to principles of the highest geometry, and destined to lodge and nourish a posterity which is not even their own. Solitary bees and wasps form also very complicated nests for their eggs. From the egg there springs out a worm, which has never seen its mother, which does not know the structure of the prison in which it is enclosed, but when once it is changed into a wasp or bee, it constructs a similar nest, equally perfect, for its own egg.

"We cannot," says Cuvier, "form a clear idea of instinct, but by admitting that the animals endowed with it have, in the sensorium, continued innate sensations and images, which determine them to act, like sensations received through the external organs of sense. Instinct is a kind of dream, or vision, that perpetually haunts them, and prompts them to action, and in every thing that respects their instinctive motions, we may regard animals as a kind of somnambulists. Instinct has been granted to animals as a supplement to intelligence, to concur, together with their strength and fecundity, in the preservation of each species, in their due proportions. There are no visible marks of instinct in the animal conformation ; but intelligence, as far as we can observe, is in a constant proportion to the relative size of the brain, and particularly to that of its two hemispheres."

The following remarks of Dr. Hartley, on the intellectual faculties of brutes, are extremely judicious, and so much to the purpose of the present essay, that I shall subjoin them: — "The whole nature of each brute which has been brought up among others of the same species, is a compound of instinct, its own observation and experience, and imitation of those of its own species. Instinct seems to have exerted its whole influence when the creature is arrived at maturity, and has brought up its young, so that nothing *new* can be expected from it (instinct) afterwards. But the intellectual acquisitions of brutes, from observation and experience, continue; whence old brutes are far more cunning, and can act better (*pro re nata*) as circumstances arise, than young ones. It ought also to be remembered that brutes, from their want of words, and from our ignorance of those symbols which they use in giving intimations to each other or to man, cannot make manifest to us the extent of the reason they possess." (*Observations on Man*, vol. i. p. 414.) B.

Art. III. *On the Aërial Spider.* By John Murray, Esq. F.S.A. F.L.S. F.H.S. &c.

Sir,

I feel gratified by the favourable review of my *Experimental Researches in Natural History* (published by George B. Whittaker, Ave Maria Lane), in your Second Number. As far as I know, I have not ventured beyond the pale of sound and sober reasoning, in the true spirit of inductive science.

I have not presumed any thing in the shape of an opinion on the origin of light. It issues from a cloud which conceals its source. I have not attempted to penetrate its depth and labyrinth. I may, however, be permitted to add that Canton's phosphorus is merely composed of calcined shells, which a high temperature illuminates. There is a considerable brilliance excited, when the electric discharge is passed through this substance, and I have found the following a very pretty experiment: — Having strewn Canton's phosphorus (as it is called) over the surface of mercury contained in a shallow basin, I immerse into the fluid metal one of the wires of an extensive galvanic battery, and bring the other polar wire in contact with its surface; at this moment the calcined particles become beautifully luminous, and continue to glow for some time after the positive and negative wires have been withdrawn. The nature of the subject treated of in my little volume, necessarily precluded a more full view of the nature and laws of light, and its multifarious sources, and what I have introduced can be only considered a very partial and superficial glance, as prefatory to the topic treated of, namely "the light and luminous matter of the glowworm."

The object of this communication must, however, be chiefly confined to the ascent and flight of the aërial spider.

Mr. Blackwall's observations (*Lin. Trans.*, vol. xv. part ii. p. 449. et seq.) on this curious question are cited, in opposition to my numerous and varied experiments; but I cannot admit that they possess much consequence or force. It does not appear that this author had seen an account of my experimental researches on the ascent of the little aëronaut; otherwise, he might have hesitated in committing himself to the Linnean Society, in the view he has endeavoured to sustain, but which, however, I believe is not new.

M. Gay Lussac having found that soap bubbles would not ascend in a room, though their ascent is rapid in the open air, unhesitatingly ascribes their ascent to warm currents emanating from the surface of the ground; rooted in this opinion, Mr. Blackwall concludes that the flight of the spider originates in a similar cause.

Contrary to the assertion, that "spiders have no power of propelling their webs without assistance from the wind," I fearlessly maintain that they can do so in an atmosphere in which the very leaf of the aspen remains motionless; and although their *char volant* obeys the direction of the breeze, this simple fact proves nothing in favour of the opinion advanced by Mr. Blackwall. The aëronautic spider can propel its threads both horizontally and vertically, and at all relative angles, in motionless air, and in an atmosphere agitated by winds; nay more, the aërial traveller can even dart its thread, to use a nautical phrase, in the "wind's eye." My opinion and observations are based on many hundreds of experiments; on favourable occasions I am constantly extending their amount; and as often do I find my deductions supported, namely, that the entire phenomena are electrical. My inferences, therefore, have not been hastily drawn.

When a thread is propelled in the vertical plane, it remains perpendicular to the horizontal plane, always upright, and when others are projected at angles more or less inclined, their direction is invariably preserved; the threads never intermingle, and when a pencil of threads is propelled, it ever presents the appearance of a divergent brush. These are electrical phenomena, and cannot be explained except on electrical principles.

The specific gravity of the insect, with its web, are very superior to that of the atmosphere, and without some exotic power imparted to them, their rise in the atmosphere would be impracticable; and though a film inflated with heated, and of course, rarefied air, would certainly ascend, it is more difficult to undersand how a solitary thread, so fine, could be thus acted upon by any current of air, whether heated or not, so as to determine its buoyancy and ascent. And so far from the unattached cobwebs, which are occasionally seen to float in the atmosphere, having been "raised from the surface of the ground, by the action of air highly rarefied by a cloudless sun," such threads will be seen to fall in the warmest weather, and in all the unclouded radiance of the sunbeam. But this phenomenon presages rain, and is its precursor. The electrical character of the atmosphere has changed from positive to negative.

These interesting aëronauts sometimes rise with the rapidity of an arrow in the zenith of the observer; at other times, they are seen to float parallel with the plane of the horizon; and again, at variously inclined angles. Sometimes the ascent is extremely slow. An ascending current of warm air, it is conceivable, might effect a vertical movement; but how it could push the insect along in the horizontal plane, is an enigma of more difficult solution.

I do not understand what Mr. Blackwall means, in what he says about the electricity of the atmosphere. I take it for granted, that it is seldom or never in a neutral state, with respect to electricity, being either positively or negatively electrical; in which view I am warranted, not merely by my own experiments, but of those conversant with atmospherical electricity. In clear fine weather, the air is invariably positive; and it is precisely in such weather that the aëronautic spider makes its ascent most easily and rapidly, whether it be summer or winter; I have often seen this in winter, during an intense frost, a circumstance which renders the action of warm currents of air, as accessory to its flight, something more than questionable. Our aëronaut may be met with in its descent over the Mer de Glace, as well as over the Lake of Geneva; and it will take flight as readily from a point over the Frozen Sea, as from the heated surface soil of the Valley of Chamouny. I am not yet convinced that there are calorific emanations from the Glacier de Bois.

When the air is weakly positive, the ascent of the spider will be difficult, and its altitude extremely limited, and the threads propelled will be but little elevated above the horizontal plane. When negative electricity prevails, as in cloudy weather, or on the approach of rain, with a falling barometer, and the index of De Saussure's hygrometer rapidly advancing towards *humidité*, the spider is unable to ascend. Towards evening the positive electricity of the air becomes feeble, and during night changes to negative; and at these periods the aëronauts descend from their skyey elevation to the earth. I have already clearly proved, experimentally, that the thread is imbued with negative electricity: and such a thread, darted through the air with force and velocity, must of necessity become electrified, as a consequence of the friction it must suffer from the resisting medium it permeates. Such a thread, with its attachment, must ascend, until it is neutralised by its equivalent of positive electricity. These insects descend in vast numbers during the night to imbibe the dew, which condenses on the webs they weave among the grass; the attachment of globules of dew to the tips of the blades of grass, seems an electrical phenomenon, and as the thread must be considered a nonconductor of caloric, the fact of its being bedewed seems most easily referable to electricity.

I caught one of these aëronautic spiders a few days ago, the folding glass doors of the library room leading into the garden were open, and the insect being conveniently arranged, it darted forth, from within the room, a lengthened thread diagonally upwards, and thus effected its ascent; a fact at complete antipodes with Mr. Blackwall's opinion.

The number of the aëronautic spiders occasionally suspended in the atmosphere, I believe to be almost incredible, could we ascertain their amount. I was walking with a friend on the 9th, and noticed that there were four of these insects on his hat, at the moment there were three on my own; and from the rapidity with which they covered its surface with their threads, I cannot doubt that they are chiefly concerned in the production of that tissue which intercepts the dew, and which, illuminated by the morning sun, "glitters with gold, and with rubies and sapphires." Indeed, I have noticed that, when the frequent descent of the aëronautic spider was determined, a newly rolled turnip field was, in a few hours, overspread by a carpet of their threads. It may be remarked that our little aëronaut is very greedy of moisture, though abstemious in other respects. Its food is perhaps peculiar, and only found in the superior regions of the sky. Like the rest of its tribe, it is doubtless carnivorous, and may subserve some highly important purpose in the economy of Providence; such, for instance, as the destruction of that truly formidable, though almost microscopically minute insect, the Fùria infernàlis, whose wound is stated to be mortal. Its existence has been indeed questioned, but by no means disproved; that, and some others, injurious to man, or to the inferior creation, may be its destined prey, and thus our little aëronaut, unheeded by the common eye, may subserve an important good.

As connected with this question, I may mention that the electrical strata of the atmosphere, on Sunday the 6th inst., was singularly illustrated in the curious configurations of the dust on the pavement, being exhibited in a plumose form, resembling the figures described on a plate of rosin when touched by an electrified substance, and powdered rosin or sulphur, &c., is projected against them: an experiment we owe to Professor Lightenberg; while, I believe, the late Dr. Millar, of Edinburgh, was the first to notice these very interesting arborescent forms of dust, and refer the phenomenon to electricity. I noticed, also, on that day, that these configurations had their feathery image and impress in the sky, several of the clouds presenting that plumose form.

I now beg to quote an extract from a communication on the subject of the gossamer spider, made to me by my friend, J. E. Bowman, Esq. F.L.S.; and I shall at present content myself with it, not wishing to anticipate what may elsewhere appear on this subject. "We arrested several of these little aëronauts in their flight, and placed them on the brass gnomon of the sundial, and had the gratification to see them prepare for, and recommence, their aërial voyage. Having crawled about for a short time, to reconnoitre, they turned their abdomens from the current of air, and elevated them almost perpendicularly, supporting themselves solely on the claws of their fore legs, at the same instant shooting out four or five, often six or eight, extremely fine webs, several yards long, which waved in the breeze, diverging from each other like a pencil of rays, and strongly reflecting the sunbeams. After the insects had remained stationary in this apparently unnatural position for about half a minute, they sprang off from the stage with considerable agility, and launched themselves into the air. In a few seconds after they were seen sailing majestically along, without any apparent effort, their legs contracted together, and lying perfectly quiet on their backs, suspended from their silken parachutes, and presenting to the lover of nature a far more interesting spectacle than the balloon of the philosopher. One of these natural aëronauts I followed, which, sailing in the sunbeams, had two distinct and widely diverging fasciculi of webs, as in the annexed sketch (*fig.* 161.); and their position in the air was such, that a line uniting them would have been at right angles with the direction of the breeze."

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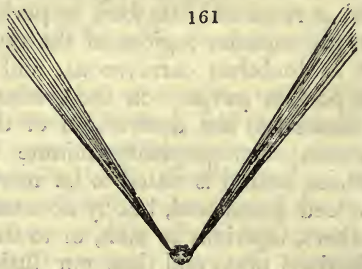

In conclusion, permit me to mention, in reference to the glowworm, that I was quite aware of the opinion that had been entertained respecting the light of the glowworms, and reiterated by my reviewer; and the reason why I did not mention it was, that I held it to be unsatisfactory; my reasons are, that the insect, in its imperfect form of the larva, is gifted with light, as well as in its perfect and ultimate stage of metamorphosis. The winged male, as in the *L*ampỳris itálica, carries its torch as well as the apterous female. Superadd to these, that the inference would not apply to the case of the crawling *S*colopéndra eléctrica on the one hand, or the winged Fúlgura lanternària on the other,

"That shoot like stars athwart the night."

I have the honour to be, Sir, &c.

July 16. 1828. J. Murray.

Art. IV. *Account of a monstrous Production of the Sheep Genus.* By John Chichester, Esq. M.D.

Sir,

In the course of the spring of 1827, I was requested by Mr. Averill, a surgeon of distinction, settled in this place, and well known to the profession by his treatise on operative surgery, to assist him in the examination of a monstrous production of the sheep genus (*O'*vis *Lin.*). We were aware that, by the means of injection, we should be most likely to discover such facts as might be brought to bear upon the science of organisation; but, besides some other unfavourable circumstances, putrefaction had too far advanced to admit of its being minutely executed; in which way only, perhaps, can the investigation of the law which governs those anomalies be successfully conducted.

The great difference in the opinions which prevail at present respecting monsters, comes, in all probability, from an insufficiency of facts, or, rather, from an imperfect detail of them; since the greater part of the many cases to be found in books, scarcely furnishes one probable induction, so loosely and indistinctly are they stated. Their philosophical history is still in its cradle.

The strange and irregular production of nature which at present engages our attention, had only one head, which was of the natural size, and complete in all its parts. It cannot be regarded as being acephalous, in respect to one of the two bodies, for the head was equally in common to both.

There was one atlas only, of regular form, but somewhat larger than natural. This circumstance, together with one complete head, without the least rudimentary trace of a second, is sufficient to exclude all idea of absorption having played any part in this monstrous production; while, on the other hand, it favours very strongly the opinion of Blumenbach, Meckel, and Geoffroy St. Hilaire, who lay it down as an axiom, that all monstrosities (called by the latter *les anomalies connées*) are the result of interrupted developement.

The second vertebra was single at the upper part, with only two articular surfaces, and of a size corresponding with the bone above it; below it was double, and, consequently, had a breadth somewhat out of proportion to its superior part. Hence went off two distinct vertebral columns, both containing the usual number of vertebræ in each division, and each of them seemed perfect, to the very caudal extremities. We found the whole of the other bones complete in number, as well as form, throughout both skeletons.

The ribs of the right side of one animal were connected with those of the left side of the other, by a regularly formed sternum; while those of the opposite side, i. e. the left of one animal, and the right of the other, formed nearly a horizontal plane, and were connected by a second sternum, turned the reverse way of the other. The right scapula of the left animal, and the left scapula of the right animal, lay superiorly, while the corresponding scapulæ were situated immediately beneath, supporting the fore part of the common trunk. It does not seem that any thing further remains to be said respecting the bony parts; which, by the joint aid of Messrs. Averill and Charles Fowler, have been formed into a natural skeleton of great beauty, and deposited in the museum attached to the Casualty Hospital of this town.

In respect to the soft parts, there was only one œsophagus, which was natural, and passed down, between the two vertebral columns, to the stomach, through a diaphragm which separated one thoracic and one abdominal cavity in common to the two animals.

The stomach was single, and of the same regular, though complex, structure, that it is found to be of in all ruminating animals. The four divisions were distinct, and, in every respect, quite natural.

From the pyloric extremity of the stomach, passed off a set of small intestines, which were in common to the two bodies; the last of them terminated somewhat on the right side of the centre of an arch, which had the distinguishing characters of a colon; this passed down on each side to something resembling a sigmoid flexure, and then, from the base of each sacrum, descended, through each pelvis, a rectum, terminating in its own external opening. No trace of a cæcum could be found.

There was a liver, rather larger than natural, lying under the right ribs of the left body; and beneath the right ribs of the right body, near the inferior sternum, was discovered another, about half the size of the former. Each had a distinct set of vessels, but we could only detect one gall-bladder. The circumstance of there being two livers in this case, with only one heart, as will be seen hereafter, very much increases the anomaly; for it is laid down by a systematic writer, that "avec le cœur manque constamment le foie." We could only find one pancreas and one spleen.

The kidneys were double, and so were the whole pelvic viscera. The animals were both males, and the genital organs appeared to be natural. It has been asserted by Pohle, Palfyn, and others, that the greater number of monsters are of the female sex; but, as far as my observation has been extended, the fact has turned out differently, the much greater number having been males. In both cases, I am inclined to suppose it merely a matter of chance; and that, upon a large scale of investigation, the numbers would be found nearly equal. That, however, which occurred to the above-mentioned authors was easily seized upon to support their own hypothesis, — that, in the female, the plastic, or moulding, force is less powerful than in the male. It is, I believe, also generally admitted, that, in acephalous monsters, the viscera of the abdomen and pelvis are found more or less rudimentary only, particularly the urinary and genital organs; but, in the case before us, the genital organs, as well as all the other pelvic viscera, were completely formed.

There was only one trachea, which descended into a thoracic cavity in common to the two animals. This cavity contained only one set of lungs, one division of them lying against the ribs of the right side of the one animal; the other division, against the left ribs of the other. There existed no mediastinum.

Only one heart could be found, which was of the natural size and structure: but from each ventricle sprung an aorta; of these two vessels, one turned to the right, the other to the left. The one which turned to the left, went down in the natural direction; while that which turned to the right, crossed the right vertebral column, and passed down on the outer side of it. A transverse vessel, of somewhat smaller caliber, passed from the beginning of the turn of the arch on one side, to the same part on the other side, thus forming a communication between the two aortas. The circumstance of there being only one heart, and that of the natural size only, while the two animals appear, with the exceptions that have been stated, to have experienced no interruption in their intra-uterine growth, seems to make it doubtful whether, according to M. Serres, the sanguiferous system is to be considered as regulating and forming all the others. It is held also, by many other physiologists besides M. Serres, that the strength and volume of all the organs are in direct proportion to the quantity of blood bestowed upon them.

Such are the striking circumstances that presented themselves to my observation. I am not aware that any description of a similar monstrosity is to be found in books, or that any such is contemplated by Geoffroy St. Hilaire, or any other systematic writer. I remain, Sir, &c.

JOHN CHICHESTER, M.D.

Cheltenham, July 24. 1828.

Art. V. *On the Manners of the Nuthatch.* By H. S. With a Note by W. Swainson, F.R.S. &c.

I had never seen the little bird called the Nuthatch (*Sítta europæ̀a*) (*fig.* 162.), when, one day, as I was expecting the transit of some wood-pigeons under a beech tree, with a gun in my hand, I observed a little ash-coloured bird squat himself on one of the large lateral trunks over my head, and, after some observation, begin to tap loudly, or rather solidly upon the wood, and then proceed round and round the branch, it being clearly the same thing to him whether his nadir or zenith were uppermost. I shot, and the bird fell: there was a lofty hedge between us, and when I had got over he had removed himself. It was some time before I secured him, and I mention this, because the manner in which he eluded me was characteristic of his cunning. He concealed himself in holes at the bottom of a ditch, so long as he heard the noise of motion, and, when all was still, he would scud out and attempt to escape. A wing was broken, and I at length got hold of him. He proved small, but very fierce, and his bite would have made a child cry out. The elbow joint of the wing being thoroughly shattered, and finding that he had no other wound, I cut off the dangling limb, and put him into a large cage with a common lark. The wound did not in the least diminish his activity, nor yet his pugnacity, for he instantly began to investigate all possible means of escape; he tried the bars; then tapped the woodwork of the cage, and produced a knocking sound, which made the room reecho; but, finding his efforts vain, he then turned upon the lark, ran under him with his gaping beak to bite, and effectually alarmed his far more gentle and elegant antagonist. Compelled to separate them, the nuthatch, for this bird I discovered him to be by turning over the leaves of an *Ornithològia*, was put into a smaller cage of plain oak wood and wire. Here he remained all night; and, the next morning, his knocking or tapping with his beak was the first sound I heard, though sleeping in an apartment divided from the other by a landing-place. He had food given to him, minced chicken and bread crumbs, and water. He eat and drank with a most perfect impudence, and the moment he had satisfied himself turned again to his work of battering the frame of his cage, the sound from which, both in loudness and prolongation of noise, is only to be compared to the efforts of a fashionable footman upon a fashionable

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door in a fashionable square. He had a particular fancy for the extremities of the corner pillars of the cage; on these he spent his most elaborate taps, and at this moment, though he only occupied the cage a day, the wood is pierced and worn like a piece of old wormeaten timber. He probably had an idea, that if these main beams could once be penetrated, the rest of the superstructure would fall and free him. Against the doorway he had also a particular spite, and once succeeded in opening it; and when, to interpose a farther obstacle, it was tied in a double knot, with string, the perpetual application of his beak quickly unloosed it. In ordinary cages a circular hole is left in the wire for the bird to insert his head, to drink from a glass: to this hole the nuthatch constantly repaired, not for the purpose of drinking, but to try to push out more than his head, but in vain; for he is a thick bird, and rather heavily built; but the instant he found the hole too small he would withdraw his head, and begin to dig and hammer at the circle, and where it is rooted in the wood, with his pickaxe of a beak, evidently with a design to enlarge the orifice. His labour was incessant, and he eat as largely as he worked; and I fear it was the united effects of both that killed him. His hammering was peculiarly laborious, for he did not peck as other birds do, but, grasping his hold with his immense feet, he turned upon them as upon a pivot, and struck with the whole weight of his body, thus assuming the appearance, with his entire form, of the head of a hammer, or, as I have sometimes seen birds on mechanical clocks made to strike the hour by swinging on a wheel. We were in hopes that when the sun went down he would cease from his labours, and rest: but, no; at the interval of every ten minutes, up to nine or ten o'clock in the night, he resumed his knocking; and strongly reminded us of the coffinmaker's nightly and dreary occupation. It was said by one of us, "he is nailing his own coffin;" and so it proved. An awful fluttering in the cage, now covered with a handkerchief, announced that something was wrong: we found him at the bottom of his prison, with his feathers ruffled, and nearly all turned back. He was taken out, and for some time he lingered amidst convulsions, and occasional brightenings up; at length he drew his last gasp; and will it be believed that tears were shed on his demise? The fact is, that the apparent intelligence of his character, the speculation in his eye, the assiduity of his labour, and his most extraordinary fearlessness and familiarity, though coupled with fierceness, gave us a consideration for him that may appear ridiculous to those who have never so nearly observed the ways of an animal as to feel interested in its fate. With us it was different.

Since our poor nuthatch died, I have observed that White, in his charming work on the *Natural History of Selborne*, states that the knocking of the nuthatch may be heard at the distance of a furlong; and that he has frequently placed nuts in the joints of a gate for this bird, which were quickly penetrated by his beak, and the kernel extracted. The beak is uncommonly large and strong for so small a bird. I have requested my friend Mr. Swainson to add a short scientific note to this memoir; such matters not coming within my range. H. S.

Note by Mr. Swainson. — After this animated sketch from nature (would that we had more of them!) scientific details will appear dry; yet a few may not be misplaced. The great force with which, as my friend describes, this little bird laboured with its bill, led me to examine it minutely, and to compare it with several of the extra-European species; but in none of these is the bill of an equal size and proportionate strength. It may further be remarked, that, among the Síttæ generally, the end of the bill is more depressed than compressed, while the tip is generally rounded: but in the European nuthatch, this part, when viewed laterally (*fig.* 163. *a*), exhibits a good deal of that abrupt truncation so well adapted for breaking hard substances, which is seen in the woodpecker, the point of whose bill exactly resembles that of a wedge. The only foreign species I have seen, in which any thing like this structure can be traced, is the Sítta carolinénsis. The group evidently stands intermediate between the true Certhìadæ and the Picìdæ of modern ornithologists. To the latter it is assimilated by its perfectly straight and somewhat wedge-shaped bill, and by a corresponding economy of habit in procuring nourishment, already so well described. On the other hand, the feet of the Síttæ, although scansorial, are not of that peculiar construction which constitutes the typical perfection of climbing birds; the toes, as in all the Certhìadæ, being placed three forwards and one backwards. With this union of characters I am disposed to consider the Síttæ as a distinct type or sub-family of Certhìadæ, and that by which nature passes to the true woodpeckers, through the intervening forms of Oxyrhýnchus and Yúnx. The tongue is not capable of extension; it is bifid, with the divisions slightly ciliated (*fig.* 163. *b*). — *W. S.*

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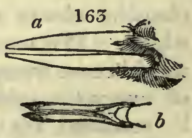

Art. VI. *Manners and Economy of the Pied Flycatcher.* By John Blackwall, Esq.

Sir,

In directing the attention of the ornithological readers of the Magazine of Natural History to a favourite haunt of the Pied Flycatcher (Muscicàpa luctuòsa *Temminck*) (*fig.* 164.), I am not without hope that some individual, who has leisure for the undertaking, may be stimulated to investigate the manners and economy of this interesting species, with a greater degree of minuteness than has hitherto been done. The elucidation of several doubtful points in its history could not fail to reward his industry, and promote the interests of science.

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On the 3d of June last, I procured a male Pied Flycatcher in the woods near the ferry-house, on the western shore of Windermere, where I saw two males and a female. The female and one of the males had paired, and were occupied in constructing a nest in a hole in a decayed pollard ash, on the margin of the lake. But the vicinity of Ullswater appears to be the most favoured resort of this species; as in walking, on the 1st of June, from the Water-head to Gowbarrow Old Park, on the western side of the lake, a distance not exceeding three miles, I saw, without quitting the carriage road, five males at five separate stations, which were distinctly marked by large pollard ashes, partially decayed. To these spots the birds were evidently much attached, reluctantly retiring from them to a short distance when greatly disturbed, and immediately returning again when the cause of their alarm was removed. This circumstance led me to suppose that they had nests; and as I did not observe a single female, it is probable that they were engaged in incubating their eggs, or in brooding their young. The males were all in full song, and their notes, which are sometimes, though rarely, delivered on the wing, are pleasing and varied.

Ornithologists do not seem to be acquainted with the extent of the vocal powers possessed by this species. According to Dr. Latham (*General History of Birds*, vol. vi.), Mr. Bolton, the author of *Harmònia Ruràlis*, has remarked that the song of the male, which is heard in the breeding season, resembles that of the Spotted Flycatcher, but that it is more sprightly and energetic. The comparison is an unfortunate one, and may have induced a belief that the Pied Flycatcher has no song whatever, as the spotted species is one of our most silent birds. I am happy, therefore, in being able to claim for the Pied Flycatcher a place among British singing birds.

Both Montagu and Latham have regarded the Pied Flycatcher as indigenous to England; but, in Lancashire, I have never seen this species earlier in the year than April, nor later than September. Its habits indicate a bird which preys principally on insects in their winged or perfect state, and, as such, there can be little doubt that it is migratory. A sufficient reason, however, why the fact has not been more clearly ascertained, will be found in its great rarity and partial distribution.

I have long known that the Pied Flycatcher breeds annually in the beautiful woods near Ullswater, but I was not aware, before the present summer, that it is to be found in such abundance in that delightful locality.

I am, Sir, &c.

Crumpsall Hall, July 28. 1828. JOHN BLACKWALL.

ART. VII. *On the Instinct of Insects.* By J. H. DAVIES, Esq.

Sir,

IT has been asserted that the circuitous flight of the butterfly tribe arises from one sex pursuing through the air the track of the other; and that, if an unimpregnated female of the *P*halæ̀na *q*uércus (egger moth) be carried in a gauze cage into the haunts of that species, numbers of the males will be attracted, so as to be easily captured. I have never had an opportunity of verifying this fact; but, from a circumstance which occurred to me during the past year, I have no doubt of its correctness.

I was engaged in rearing lepidopterous insects from the larvæ, and had a great variety of the pupæ of different species; one evening I found a female *S*phínx ocellàta just emerged, which, in lifting from the floor, ran up my arm, and round the collar of my coat: two hours afterwards, on returning to my study from shutting some glass frames in the garden, a very fine male of the same species was fluttering on my shoulder, where the female had previously crawled. But a still more curious fact, which must appear almost incredible, remains to be stated. Two females of the *S*phínx *p*ópuli were developed; the next day I found three males in the room. As no one had entered it in the interval, nor was there apparently any mode by which they could gain access, I was somewhat puzzled to account for their appearance. The same evening, however, their mode of *entrée* was made apparent, by two more males of the same species coming *down the chimney*, one of which fell into a vase standing in the fireplace where I captured it before it could extricate itself. Afterwards, on occasion of the evolution from the pupa state of females of the *P*halæ̀na bucéphala and *P. s*ălicis, the windows of my study were completely besieged by males of the same species, which, on throwing open the windows, eagerly rushed in. The instinct which in these cases must have guided the little animals is truly wonderful.

I remain, Sir, &c.

Portsmouth, August, 1828. J. H. Davies.

Art. VIII. *The Jussieuean, or Natural, System of Plants.*

(*Continued from* p. 240.)

Order XIII. FLACOURT*IA'NEÆ.*

A very small order formerly comprised in *T*iliàceæ. It is remarkable on account of the structure of its fruit, to the inner lining of which the seeds are attached upon a branched placenta. Nothing is known of the properties of the flacourtias. The berries of Flacoúrt*ia Ramóntchi* are eaten in Madagascar. The order consists entirely of small tropical trees or bushes.

Flacoúrt*ia* Herit.

Order XIV. *C*APPARI'DEÆ.

These are nearly related to Crucíferæ, of the properties of which they partake. Many are very pretty plants, especially Cleòme *r*òsea, and the various species of Cratæ̀v*a*. The common caper is an elegant bush, remarkable for its large white flowers and long purple stamens. The species are found occasionally in various parts of the world. The different kinds of *C*ápparis are reputed to be stimulating, antiscorbutic, and aperient. The bark of the root of the common caper passes for a diuretic medicine. Several species of Cleòme have an acrid taste, which has been compared by travellers to that of mustard. The root of Cleòme dodecándra is employed as a vermifuge in the United States; and the leaves produce an inflammation of the skin, whence they are used in Cochin-china as a sinapism. (*Dec.*)

*C*ápparis *L.* Cratæ̀v*a* L. Cleòme *W.*

Order XV. *V*IOLARIEÆ.

This is one of the most favourite orders with gardeners; consisting, as it chiefly does, of the Violet genus, from which most of the others are recent dismemberments. The greater part consists of hardy herbaceous plants, some of which are remarkable for their perfume, others for their brilliant colours, and all for their neatness. They are natives of the temperate or cold zones of both hemispheres, often growing at great elevations above the sea. Among them is a tribe called Alsodíneæ, consisting of suffrutescent tropical plants; but none of them have been introduced to the gardens of this country. The attention of collectors should be directed to procuring the shrubby *V*iolàceæ of Brazil, some of which possess great interest. The medical properties of the order are found principally in their roots, which appear to possess, in all cases, emetic properties, in a greater or less degree. One of the ipecacuanhas is the root of a Brazilian violet. M. Decandolle has the following observations upon the affinities of the *V*iolarièæ: — They are very nearly akin, he observes, to the *P*olygàleæ and Droseràceæ, and especially to the Passiflòreæ. From the first they are distinguished by their unilocular fruit, leaves furnished with stipules and two-celled anthers; from Droseràceæ by their solitary style, lengthened embryo and stipulate leaves, the vernation of which is involutive, not circinate. From Passiflòreæ they differ in their fruit being capsular, not berried; in their albumen being compact and shining, not pitted; in their stamens being hypogynous, not perigynous; in their anthers being attached along their whole length, not fixed by their middle; finally, in their stigmas being one and not three. The genus Calýptrion approaches Passiflòreæ in its twining stem, and Hymenanthèra borders upon *P*olygàleæ on account of its monospermous pericarpium with solitary pendulous seeds.

Ionídium *Vent.* *V*ìola *Tou.* Sauvagès*ia* Jacq.

Order XVI. *P*OLYGA'LEÆ.

Most of the plants of this order are interesting, and deserving the attention of the gardener, some for their neatness, some for their beauty, and some for their use in medicine. They are natives of most countries, and are either low herbaceous plants, occasionally less than an inch in height (small specimens of *P*olýgala purpúrea), or shrubs varying from a dwarf, rigid, spiny habit, to a tall, graceful, drooping appearance. *P*olygàleæ are remarkable for the union of their stamens into a single body, their one-celled anthers opening with a pore, and their irregular flowers, one of which is often keel-shaped, and beautifully crested or bearded. The leaves have generally a bitter astringent taste, which is much more abundant in the roots, combined with an acrid and somewhat resinous flavour: these properties are particularly sensible in *P.* Sénega, which is reputed a sudorific, diuretic, sialagogue, cathartic, or mild emetic, according to the manner in which it is administered. The yelhoi of South America, the root of a species of Monnina, has the same properties as *P.* Sénega, and is particularly used as a remedy for dysentery. The well known rattany, or ratanhia, root of Chile, is the produce of a plant of this order, and possesses powerful tonic and astringent qualities. According to the analysis of a French chemist, it contains gallic acid, but neither tannin nor resin.

Polýgala *Tou.* Murált*ia* Neck. Múndia *Kunth.* Securidàca *L.*

Order XVII. DROSERA'CEÆ.

The order of sun-dews is a small group of plants, natives of marshes or inundated grounds in all the temperate parts of the world. The species are very remarkable for the abundance of glandular hairs with which all the parts of the foliage are covered. Only two species are in any degree frutescent. The young leaves are always rolled up in the circinate manner, so remarkable in ferns. Their medicinal properties appear to be trifling: the leaves have the power of curdling milk.

Drósera *L.* Dion*æ'a* W.

Order XVIII. *BIXI'NEÆ.*

The plants of this order are few in number, and not remarkable either for beauty or use. The *Bíxa Orellàna* is chiefly known for producing the seed called in the shops arnotta (*rocon*, Fr.) and used for colouring cheese; the properties of the arnotta are slightly purgative and stomachic. They are all bushes or small trees, and mostly tropical. Azaras, Chilian shrubs, with fragrant flowers, are not yet known in the gardens of Europe.

Bíxa L. *Próckia* L.

Order XIX. CISTI'NEÆ.

The common rock-roses of our gardens give an accurate idea of this order, which contains little else. They are all very ornamental, and particularly well calculated for covering rockwork. The species of Cístus and Heliánthemum have been multiplied by Dunal in an extravagant manner, as has been well demonstrated by Mr. Bentham. They are natives of most parts of the world in dry elevated places. The gum called ladanum is the produce of some kinds of *C*ístus; it exhales a fragrant perfume when burnt, and possesses slightly tonic and stomachic properties.

Hudsòn*ia* L. *C*ístus *Tou.* Heliánthemum *Tou.* Lechè*a* L.

Section 3. *Ovarium solitary; Placenta central.*

Order XX. CARYOPHY'LLEÆ.

These consist of herbs or low undershrubs, inhabiting the mountains and pastures of all parts of the world. In Europe and Siberia they are particularly abundant, and least so in Africa and South America. Many are common weeds, as most of the cerastiums, spergulas, and others. Several of the silenes are very ornamental, and among the arenarias are to be found some dwarf species of considerable elegance. But it is in Diánthus that the pride of the order consists: this genus is almost unrivalled for the brilliancy of its colours, the neatness of its foliage, and the perfume of its flowers. From the finest of its species the title of the order has been derived. The virtues of Caryophýlleæ are slight. Saponària officinàlis, and one or two others, have been praised for possessing antisyphilitic properties; the root of Silène virginiàna is reputed anthelminthic; and the Arenària *p*eplöìdes, being fermented, is used by the Icelanders for food.

Tribe 1. Sile'neæ.

Gypsóphila *L.*	*C*ucùbalus *L.*	Agrostémma *L.*
Diánthus *L.*	Silène *L.*	Velèz*ia* W.
Saponària *L.*	*L*ýchnis *L.*	*D*rỳpis *L.*

Tribe 2. *Alsi'neæ.*

Ortèg*ia* L.	*E*latìne *L.*	Spérgula *L.*	Arenària *L.*
Buffòn*ia* W.	*M*ollùgo *L.*	Larbrè*a* St. Hil.	Cerástium *L.*
Sagìna *L.*	*P*harnàce*um* W.	Stellària *L.*	Cherlèr*ia* Hal.
Mœhríng*ia* L.	*H*olósteum *L.*	*A*lsìne *L.*	

Order XXI. *LI'NEÆ.*

Separated by M. Decandolle from Caryophýlleæ, from which it is well distinguished by its fruit having several cells, or, in the language of the botanist just named, being formed by the cohesion of several carpella. Most of the species are pretty plants, bearing yellow, blue, or white flowers. They are of immense importance in the world, on account of the tenacity of their fibres when made into flax. The seeds of common flax are between mucilaginous and oily; the leaves of *L*ìnum cathárticum and *L.* *s*elaginöìdes, the latter a native of Peru, are purgative.

*L*ìnum *Bauh.* Radìola *Dil.*

ORDER XXII. FRANKENIACEÆ.

Distinguished from Caryophýlleæ by the fruit not having a central separate placenta, but bearing the seeds on the inner margin of the valves. The species are natives of arid situations in Europe, Africa, and South America. They have not much beauty, and no known medical properties. Besides the genus here recorded, there are two others mentioned by M. Decandolle.

Frankènia L.

ORDER XXIII. MALVACEÆ.

Before this order was dismembered of Bombàceæ and Byttner*iàceæ*, it contained most of the grandest flowers in nature. Even now, the splendour of the various species of *M*álva, *A*lthæ'a (to which the hollyhock belongs), and *H*ibíscus, renders it one of the most remarkable groups of plants. With the exception of the numerous genus *S*ìda, nearly all *M*alvàceæ are objects worthy of the gardener's care, particularly those which are hardy. In stove or greenhouse, the softness of their branches and leaves renders them peculiarly liable to the attacks of the red spider, mealy bug, and scale, from which few collections are free; a circumstance which makes them less generally esteemed than the surpassing beauty of many of them merits. The greater part of the order is clothed with stellate pubescence, and a reniform one-celled anther is a character common to the whole. These two peculiarities, together with the alternate stipulate leaves, distinguish *M*alvàceæ from all the rest of Dichlamýdeæ. All the species abound in a nutritive mucilage; a quality which renders the young heads of the ochro (*H*ibíscus esculéntus), an object of great value within the tropics, as an ingredient in soups: in Brazil, the Abùtilon esculéntum serves the same purposes. The emollient properties of *A*lthæ'a officinàlis, or guimauve of the French, are well known to physicians, as a remedy for catarrhs and pulmonary complaints: a decoction of the leaves of Sphærálcea cisplatìna is used for similar objects in Brazil. A species of Pavòn*ia* is employed in the latter country as a diuretic, in the form of a decoction. The straight shoots of *S*ìda micrántha are employed as rocket-sticks at Rio Janeiro: the chewed leaves of *S*ìda *c*arpinifòlia allay the inflammation occasioned by the stings of wasps. The tough fibres of many *M*alvàceæ are manufactured into cordage: their petals are astringent; whence those of *H*ibíscus *R*òsa sinénsis are used in China to blacken the eyelashes, and the leather of shoes. The fibrous threads in which the seeds of Gossýpium are enveloped furnish the valuable cotton, an article of immense importance to the world: these threads, when examined by the microscope, will be seen to be finely toothed, which explains the cause of their adhering together with greater facility than those of Bómbax and several Apocýneæ, which are destitute of teeth, and which cannot be spun into thread without an admixture of cotton.

*M*álope *L.*	*M*alàchra *L.*	*S*ìda *L.*	Redoutè*a* Vent.
*M*álva *L.*	*Urèna* L.	Pavòn*ia* Cav.	Palàv*ia* Cav.
Lavatèr*a* L.	Cristària *Cav.*	Achània *L.*	Lagunè*a* Cav.
*A*lthæ'a *L.*	A'noda *Cav.*	*H*ibíscus *L.*	*G*ossýpium *L.*
Kitaibèl*ia* W.	Perípterа *Dec.*		

Order XXIV. BOMBA'CEÆ.

Distinguished from the last by the imbricate æstivation of the calyx, and the arrangement of the stamens in five sets, or, in Linnean language, brotherhoods. The species are mostly fine trees with large showy flowers, and natives of the tropics. Some of them are among the largest trees in the world: Adansòn*ia*, the baobab of Senegal, has been seen with a diameter of twenty-five feet; and specimens of Bómbax *Ceíba* and Eriodéndron anfractuòsum, a hundred feet in height, are not uncommon. The wood of all the species is light and soft, as in *M*alvàceæ, from which this order probably does not differ in its medicinal properties.

Ochròma *Swt.*	Carolíne*a* L.	Bómbax *L.*
Helícteres *L.*	Adansòni*a* L.	Myròdia *Schreb.*

Order XXV. BYTTNER*IA'CEÆ.*

Much the same kind of plants as those of the last two orders, from which they were not formerly distinguished, and from which they scarcely differ, except in their bilocular anthers. Many of the sterculias are fine umbrageous trees, the seeds of which are large and eatable; especially those of the famous kola, which, being chewed, possess the property of rendering bad water pleasant to the palate. The seeds of the chicha, another and very noble species of the genus, are highly esteemed in Brazil for the dessert. Astrapæ'a, and several other genera related to it, are among the most beautiful in the world. The flowers of a species of *P*entápetes, called by the Indians machucunha, give out a mucilaginous refrigerant juice, which is employed in gonorrhœa. *Guazùma u*lmifòlia has its fruit filled with a pleasant mucilage, which is sweet and very agreeable; an extract of the bark of the same plant is used in Martinique to clarify sugar; its old bark is employed, in the form of a strong decoction, as a sudorific. Walthèr*ia Douradínha* contains a great deal of mucilage, and is employed by the Brazilians as an antisyphilitic.

Tribe 1. STERCULIA'CEÆ.

Stercùlia *W.* Heritièr*a* W.

Tribe 2. BYTTNER*IE'Æ.*

Theobròma *L.*	Bubròma *W.*	Rulíng*ia* R. Br.	Ayèn*ia* L.
Abròma *L.*	Commersòn*ia* W.	Buttnèr*ia* Loe.	Kleinhòf*ia* L.

Tribe 3. LASIOPETA'LEÆ.

Seríng*ia* Gay. Thomàs*ia* Gay. Lasiopétalum *Sm.*

Tribe 4. HERMANN*IA'CEÆ.*

Hermánn*ia* L. *Melòchia* L. Walthèr*ia* L.

Tribe 5. DOMBEY*A'CEÆ.*

Ruíz*ia* Cav.	Dombèy*a* Cav.	Astrapæ'a *Lindl.*
*P*entápetes L.	Melhània *Forsk.*	Pterospérmum *Schreb.*

(*To be continued.*)

ART. IX. *Nótulæ Botánicæ.* By G. A. WALKER ARNOTT, Esq.

(*Continued from* p. 242.)

O'*RCHIS.* — Lamarck and Decandolle describe the lip of *O.* laxiflòra to be three-lobed, and state that the middle lobe is shorter than the lateral ones, and, at the same time, emarginate; Willdenow and Villars (under the name of *O.* ensifòlia), and Sprengel, say that it is obcordate, but not lobed. With two such different accounts, one can scarcely believe that the same plant is intended. Be that as it may, Lamarck and Decandolle's description alone applies to what is found in the south of France. When compared with the description of *O.* palústris, it will be found to approach very close; solely, indeed, differing by the middle lobe of the lip being as short as the lateral ones. In both the sepals are acute, thus distinguishing these plants from *O.* máscula; and, in both, the sepals bent backward, not connivent, separate them from *O.* mòrio. In *O.* palústris the labellum, or lip, as to its circumscription, is round; in *O.* laxiflòra, triangular, and attached by the apex of the triangle. Though some of the above-mentioned authors take no notice of the lobes of the lip, I have one specimen, from Fòs, in Provence, in which they are very deeply marked. Mérat's *O.* laxiflòra, from the neighbourhood of Paris, if his description were made from actual observation, accords with that of Villars.

O'*phrys.* — Smith, I observe, in the *English Flora* (vol. iv. p. 273.), has lately added O'phrys arachnìtes (*fig.* 165. *a*) to our British plants. When growing, it is easily distinguished from *O.* aranífera (*b*), with which alone, in Britain, it is possible to confound it, by the flesh-coloured sepals, these being green in O. aranífera. When dry, it is chiefly distinguished by the cristate appendage at the extremity of the lip; the lip in O. aranífera being simply emarginate. There is, however, an intermediate species, which has caused great confusion to foreign botanists; it is the O. arachnìtes *Lk.* which Willdenow has improperly referred to O. aranífera. Link expressly speaks of the coloured sepals, and says, also, that the lip is emarginate, with an appendage placed in the notch, — "labii laciniæ laterales obsoletæ, media rotundata emarginata, appendice carnosa in emarginatura fusca." Now this species may be a variety of the true O. arachnìtes, but certainly not of O. aranífera. In Link's species, however, the appendage is very small and triangular, the apex of the triangle pointing forwards; while, in O. arachnìtes, the appendage is cuneate and large, curled upwards, attached by its apex, and the extremity is lobed or cristate. This last I have received from the neighbourhood of Paris and from Geneva; and have myself gathered it, though very sparingly, at the Pic St. Loup, near Montpelier, in company with Mr. Bentham; though, I presume by accident, the locality is omitted in his *Catalogue des Plantes des Pyrenées et du Bas Languedoc.* In that excellent work I find O. aranífera *Sm.* stated to be common; I, however, never observed it in Languedoc, and am inclined to think that O. arachnìtes *Link* is the plant intended. That, indeed, is extremely common throughout the south of France, and particularly abundant at the Pont du Gard. Of this several varieties occur: in some the appendage at the extremity of the lip is so small as to be scarcely perceptible. In one specimen I have, from M. Requien, of Avignon, found at Fòs, in Provence, the surface of the lip, as far as I can judge by a dried specimen, is of a uniform reddish colour, and not marked with yellow lines, and is covered all over with short hairs.

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I presume Dr. Smith's O. fucífera (*English Flora*, iv. p. 32.) has green sepals, and is not even a variety of O. aranífera; but I have not seen specimens; and, indeed, of O. aranífera itself I judge entirely by descriptions and figures, particularly that in *English Botany*, having neither gathered it myself, nor yet received the true plant from correspondents.

Edinburgh, May 24. 1828. G. A. W. A.

PART II.

REVIEWS.

Art. I. *Ornithològia, or the Birds; a Poem, in Two Parts: with an Introduction to their Natural History, and copious Notes.* By James Jennings, Author of *Observations on the Dialects of the West of England.* London. 12mo, pp. 468. Four Engravings on Wood.

Birds having less brains, and consequently (if we believe in theory) more stupidity, than quadrupeds, may, in some points of view, appear of inferior interest; but, as they form a very important link in the chain of living existence, much credit is due to those authors who, like Mr. Jennings, try to diffuse a taste for the study of ornithology. By exhibiting the science in varied points of view, it may be made delightful to almost every class of persons, and particularly to young people. In youth there is an enthusiastic and insatiable desire for the study of every branch of natural history. Not a flower blows in the meadows, nor an insect flutters by, without attracting the attention of the young; and, while we might suppose a boy to be foolishly engaged in idle pastime, gathering daisies and butter-cups, or pursuing butterflies and bees, he is, in reality, employed in a more useful study than in conning over his (to him unintelligible) class-books: he is acquiring ideas of the works of nature, which no class-book can give, which no master can instil, and which, in his maturer years, he can turn into admirable subjects for philosophical reflection, as our author has done his boyish feats of birds-nesting. (p. 10.) It is, indeed, much to be regretted that the study of THINGS is so much thrown into the back-ground, by the exclusive attention now bestowed upon WORDS. These ought to go hand in hand, for nothing can be more preposterous than compelling a boy to store up a number of words in his memory, which he does not and cannot understand; while, on the other hand, he cannot be supposed to retain a distinct or lasting recollection of things and facts, without names and words, the only sort of pegs upon which they can be permanently hung. Upon this principle, it is surprising at how early an age children can be instructed in the most interesting parts of natural history, commencing even in infancy; a subject beautifully touched on by Coleridge in his verses to the nightingale, which, though rather long, we cannot refrain from extracting: —

——— "That strain again?
Full fain it would delay me! My dear babe,
Who, capable of no articulate sound,
Mars all things with his imitative lisp,
How he would place his hand beside his ear,
His little hand, the small fore-finger up,
And bid us listen! And *I deem it wise*
To make him nature's playmate. He knows well
The evening star; and once, when he awoke
In most distressful mood (some inward pain
Had made up that strange thing, an infant's dream),
I hurried with him to our orchard plot,
And he beheld the moon; and, hush'd at once,
Suspends his sobs, and laughs most silently;
While his fair eyes, that swam with midnight tears,
Did glitter in the yellow moon-beam! Well,
It is a father's tale: but if that Heaven
Should give me life, *his childhood shall grow up*
Familiar with these songs, that, with the night,
He may associate joy."

Sibylline Leaves, 209.

As an object of elegant pursuit for country gentlemen, the study of ornithology is not inferior to any other department of nature. To the sportsman, to the gentleman farmer, and to horticulturists, the knowledge of the habits and the food of birds is indispensable, inasmuch as ignorance of the subject may often give rise to most serious injury and loss. For example, in New England the cultivated grounds were some years ago much frequented with a species of crow, and the farmers, supposing that their crops were thus injured, resolved to extirpate the whole race, and offered a price for their heads. The proscription was very successfully carried into effect; but the farmers, instead of being gainers, were severe sufferers. The crows, it should appear, like the rooks of our own country, did not frequent the fields so much for the sake of the grain, as to feed upon grubs, which, after the universal massacre of the crows, increased so numerously as nearly to destroy the entire crops, and threaten a famine. When the error was discovered, the crows were as anxiously protected as they had been formerly persecuted. Similar instances, in the case of rooks, have occurred in Britain. This view of the subject has not escaped Mr. Jennings, who makes the house sparrow say,

"How comes it that the good WE do
Is kept most carefully from view?

We hear not of the many seeds
Which we devour of noxious weeds;
Of worms and grubs, destructive things,
That each of us his offspring brings.*
What though we snatch a feast of corn
Or ere it 's safe in yonder barn,
Yet is there not enough beside
For MAN and his consummate pride?" Page 285.

Mr. Jennings has divided his work into two parts, the first comprehending British and European birds, the second foreign birds; the whole being preceded by an introductory sketch of the present state of ornithology, and accompanied by what the author calls copious, but which we should designate voluminous, notes, and which we should have arranged either in the introduction or in an appendix, as, in their present form, they both interrupt the current of the verse, and throw important facts and subjects into corners, instead of bringing them regularly and prominently forward. This, however, is an objection of small moment; for many readers are best pleased with a little irregularity, and will readily pick up chance seeds of knowledge scattered by the way-side, when they would shrink from the labour of reaping a whole field, laid out according to rule. It is, perhaps, more also in unison with the author's design, "to combine the prose portion of the work with familiar poetry, so as to render the science altogether more attractive, and to exhibit a useful epitome of it." Taking this view of the subject, we shall now take a glance at the manner in which Mr. Jennings has executed his plan of combining amusement with instruction. Respecting *nests*, we find the following in the author's introduction, which is inscribed to Mrs. Richard Kay:—

"You, LADY! when that smiling BOY,
Of promise bright, his parents' joy,
Shall upward grow, will prompt his mind
To all that's good and great—refin'd.
*   *   *   *   *
Oh! teach him, when, you will know best,
To love, admire the WARBLER'S NEST;

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* "Bewick states that 'a single pair of sparrows, during the time they are feeding their young, will destroy about four thousand caterpillars weekly.' They feed their young also with many winged insects; in London, it is presumed, chiefly with flies."

"The utility of the goldfinch is peculiarly striking, it feeding in winter, when at large, principally on thistle seed: hence it is called the thistle-finch."

We should object to the latter inference of utility, that the only thistle seed which the goldfinch can procure in winter must be unproductive, all the fertile seed being scattered by the winds during the autumn.—*Rev.*

Mark the DESIGN their nests among,
Observe the wonders of their song,—
Their habits, their intelligence,—
And say not, *Man alone has sense*,
But, SEE THE STEPS OF PROVIDENCE." Page 18.

This is accompanied by a note, occupying the greater portion of seven pages, in which brief descriptions are given of the nests of several birds; for example:—

"The *wren's* nest," he says, "is globular, and very often made of green moss, both within and without. It has a small hole on the side of it, just large enough to admit the bird. It is generally affixed to some tree, and behind it, at a few feet from the ground, so as not to be immediately in sight. The wren seems very partial to trees having ivy growing about them, most probably as, by its leaves, the nest is more effectually concealed. It does not seem to prefer any particular tree: the nest will be found very often attached to the elm or the ash; sometimes against an ivied wall, sometimes in the thatch of a house, and sometimes in a hayrick. In such cases the materials of the nest will often also be varied." In a subsequent note he says, "Its nest is generally adapted to the place against or under which it is made. Thus, although its usual structure is *green moss*, yet, if it build against the side of a hayrick, it is composed of hay; if against a tree covered with white moss, it is made of that material. This is not, however, an invariable habit, for I have known a wren's nest constructed of green moss at the edge of the *thatch* of a house, the colour of which was very different from the nest itself. Something, doubtless, depends upon the ease or difficulty with which materials can be obtained. Montagu says that the lining is invariably feathers. This is not, I think, correct. I believe, when made with *green* moss, its lining is generally of the same material." (p. 243.)

We can add our testimony to that of Mr. Jennings, for the incorrect statement of Montagu, which has been copied, we perceive, by Atkinson, in his *Compendium of the Ornithology of Great Britain*, who says it is "invariably lined with feathers;" but, among some hundreds of wrens' nests which we have seen, we never saw one lined with feathers, nor any thing besides moss, usually some of the softer *Hýpna*. The adaptation of the external part to the place where it is fixed, is also quite at variance with our observation. The wren, indeed, is very careful in selecting a snug concealment; but among ivy leaves, or under the hanging brow of a river bank, where the nest most frequently is, how is this adaptation to be accomplished? It would be wrong, however, to assert that no wren ever built a nest like that described by the ingenious and usually accurate Montagu. Wilson, in the *American Ornithology* (vol. i. p. 3.), justly remarks that, " though birds of the same species have a common form of building, yet do they not all build exactly in the same manner; for as much difference will be found in the style, neatness, and finishing of their nests, as in their voices. Some appear far superior workmen, and, possibly, age may improve them."

In his account of the nest of the gold-crested wren (Sýlvia *R*égulus), Mr. Jennings is also more correct than the author of the *Compendium*, who says it " is of a round form, with an opening in the side." (p. 97.) Mr. Jennings says, " Nest similar to that of the chaffinch, but lined with feathers; sometimes placed against a tree covered with ivy, but most commonly beneath the thick branch of a fir." He adds that Pennant says it is found principally on oak trees. We, however, have paid considerable attention to the habits of this beautiful little bird, and can say that we never observed it frequenting oaks nor woods, as the author of the *Compendium* states. It chiefly frequents fir and pine plantations, where it builds; and, if it takes short excursions thence, it is only to the nearest hedge-row, along which it flits, almost invisible, and only to be distinguished by its fairy note, somewhat like the ring of a small silver bell. The nest, we think, is more like that of the goldfinch than that of the chaffinch, to which Mr. Jennings compares it.

That our author is no servile copier of others, but has examined nature for himself, will appear from these extracts, as well as the following:—" The nest of the thrush is, exteriorly, composed of green or other moss, and a few straws; interiorly, it is plastered all over with some paste, apparently composed of rotten wood, with something to cement it; it is generally of a light buff colour. When dry, it is quite hard, so that the eggs, if moved, rattle in the nest. The statement in many of our books of natural history, that it is lined with clay, is, as far as my experience goes, founded in mistake." (p. 19.)

We agree with Mr. Jennings, that the plaster employed by the thrush is not clay; but, though it may appear to him *similar* to rotten wood, he will find that it is chiefly composed of the dung of cows. Whether there is not a small intermixture of clay, however, we cannot undertake to affirm. The magpie, a bird not very distantly allied to the *M*erulìdæ, certainly uses clay, and in no sparing quantity, to plaster over the inside of its thorny tent; and the house swallow (*H*irúndo rústica) forms the chief superstructure of its nest with clay.

In the introductory part, Mr. Jennings has very properly corrected some of the mistakes of the Hon. Daines Barrington, in his well-known paper in the *Philosophical Transactions*, on the Singing of Birds; a paper which is far from accurate, either in its facts or its reasonings. Take the following as an instance: —

" Mr. Barrington thinks that the reason why *females* do not sing is, because, if they did, when sitting on their eggs, they would be discovered. This is by no means a conclusive reason; for I once discovered a thrush's nest, by hearing the parent bird sing while sitting on the eggs. Besides, as the cock and hen of many species frequently sit on the eggs in turn, the female's not singing could be no security to the nest, while the cock was sitting and singing there." (p. 65.)

We confess we are disposed to doubt the fact of either cock or hen singing while sitting on their eggs, notwithstanding the solitary instance given by Mr. Jennings, on his own observation. It would be difficult, indeed, to prove the negative, but it is clearly contrary to the uniform instinctive care exhibited by all birds in concealing their nests. In the case of canaries, and other birds which breed in cages, we have never observed an instance of any bird singing in the act of incubation. Mr. Barrington, however, is altogether wrong in asserting that hen birds never sing. He ought to have been certain of the fact before speculating upon it. We have repeatedly heard hen birds sing; and Mr. Sweet, the well-known author of *The British Warblers*, makes the qualified statement, that "females *seldom* sing; I had a female redstart which sang a little; and female bull-finches sing as frequently as the males." Again, Mr. Sweet says, " I have had several female birds which never attempted to sing; but now I have two that sing frequently; one is a female black-cap; she sings a note peculiar to herself, and not the least like the male, or any other bird with which I am acquainted. I kept her several years before she began to sing. I have also a female willow wren, that sings nearly as much as the cock; this bird was bred up from the nest, and did not sing at all the first year. Her note is quite different from that of the male, but resembles it sufficiently to indicate that it belongs to the same species."

Mr. Jennings appears to have a leaning towards a very unfounded notion, at which we rather wonder, since he appears to be acquainted with the *American Ornithology* of Wilson. " The mocking-bird," he says, " forms a striking exception to what is generally esteemed the character of the birds of the new world, where the rich, lively, and brilliant hues of the feathered race are very often accompanied with harsh, monotonous, and disagreeable notes." (p. 374.) On the contrary, it would appear from Wilson's admirable descriptions, that the American song-birds are infinitely more numerous than those of Europe, and many of them superior to our most celebrated songsters. From the first four volumes, alone, we made out a table of no fewer than twenty-two American song-birds, which we may probably insert in a future page. In speaking of the wood thrush (*T*úrdus melòdus), Wilson remarks that it "serenades the woods, with notes as clear as those of the nightingale. Previous naturalists deny it to have any song but a single scream, confounding it with the *T*úrdus mínimus of Catesby, and affording the disciples of Buffon an argument for his absurd theory of its being the *T*úrdus mùsicus of Europe, degenerated by food and climate, and by living in a savage country, where the cries of all birds are harsh and unpleasant!" (*American Ornithology*, vol. iii. p. 34.)

Our author adverts, very briefly, to the great rapidity remarkable in the flight of some species of birds. The most extraordinary fact which has come to our knowledge on the subject, is given on the high authority of our intelligent correspondent, Mr. Audubon, respecting the passenger pigeon of America (*C*olúmba migratòria). He has shot that bird, he says, during his hunting excursions through the forests; and, on dissection, found its stomach full of fresh rice, which, to have resisted the digestive process, must have been swallowed *not many hours* preceding its death, but could not have been obtained within 800 miles of the place where it was killed.

Our notices have been hitherto chiefly taken from the prose portion of the work, but it would be injustice to the author not to give a fair specimen of his poetry, of which the merit is almost as various as the measures. We select

"THE GOLDFINCH'S SONG.

I've a snug little nest
 In a little elm tree;
This nest, I am sure,
 You'll be pleased when you see.

It is made with much care,
 And is lined so throughout;
It is neatness itself,
 Both within and without:

But a dear little mate,
 She with whom I am blest,
Is the neatest of all things
 In this little nest.

Should you pass by in May,
 When our little ones come,
Look in, and you'll find
 We've a snug little home.

No home like that home,
 Where two bosoms impart
Their finest of sympathies,
 Warm from the heart:

Where Friendship, with Love,
 Is perpetual guest;
And Affection's smooth pillow
 A soft heaving breast."

Page 252.

Before concluding, we must enter a decided protest against the introduction of the harsh-sounding terms which Mr. Jennings has Anglicised from the Greek and Latin of Mr. Vigors. We put it to the good taste of our author, whether he does not lose much more than he gains, by calling the cuckoo a Cuculid, the nightingale a Sylviad, the vulture a Vulturid, the parrot a Psittacid, the swallow a Hirundinid, &c. To call a pigeon or a partridge a Rasor, a woodpecker a Scansor, a thrush a Dentirost, or a kingfisher a Fissirost, is to our ears most grating and repulsive. The following lines, referring to the nightingale and the cuckoo, require no comment: —

> " What though there no *Luscinian Sylvia's* sweet throat,
> Nor of *Cuculid, Scansor* canorous,* the note;
> Yet the warblers abound." Page 303.

The chief merit of the book, we conceive, lies in the variety of facts which the author has selected, both from his reading and from his own portfolio. It cannot fail to be a useful present to the young naturalist. R. I.

Art. II. *Lepidóptera Británnica.* Autore A. H. Haworth. Pars IV. Londini, Wood, 428. Strand, 1828.

We have hitherto omitted to announce the publication of the fourth and concluding part of Haworth's *Lepidóptera Británnica*, of which the first part was given to the public so long ago as 1803. The work, we happen to know, would have been completed long before now, had it not been for the unfortunate failure of the printer to whom the copy was consigned, and who afterwards, owing to some unaccountable misunderstanding, refused either to print the remaining sheets, or to give back the manuscript to the author. However, " it is better late than never :" the concluding part at length made its appearance in the spring of the present year, to the no small satisfaction of many an entomologist, who previously possessed only an imperfect portion of a very useful work. The author has declined to introduce into this last part the more modern alterations and discoveries in entomological science, and has printed it in all respects uniformly with the preceding parts, just as it was originally written many years

* With all deference to Mr. Vigors, on whose authority, we presume, Mr. Jennings calls the cuckoo a *scansor*, or climber, we hesitate not to affirm that *cuckoos do not climb*, though their feet have two toes before and two behind, like the parrots and creepers. — *Rev.*

ago. In doing this, he has judged, we think, wisely; for, otherwise, the work would not have been all of a piece, and would, perhaps, have brought to our recollection the opening lines of Horace's *Art of Poetry*, —

> "Humano capiti cervicem pictor equinam
> Jungere si velit," &c.

We rejoice, however, to learn, by the postscript, that Mr. Haworth contemplates a new edition and entire revision of the whole. The science of entomology has undergone great alterations as to its nomenclature, divisions of genera, &c., since the earlier parts were printed. It has become much more popular, and more extensively studied. The original work, too, though not free from errors and omissions (as the author candidly acknowledges), is yet invaluable to the British lepidopterist, and has become exceedingly scarce. The impression was a small one, and the earlier parts have long been out of print. The new discoveries also made in this department of natural history, since the year 1803, are numerous, and highly interesting. In short, a revised edition of the work, or a new work on a similar plan, is required by the present more advanced state of the science. No one (we speak advisedly in saying this) is better qualified for such an undertaking than Mr. Haworth, who, in addition to long practical experience, possesses an extensive and profound knowledge of entomology, a most accurate and discriminating eye, and a dexterous facility in describing that most beautiful order of insects of which he treats. We sincerely hope he will put his intended plan in execution, and without delay. There can be little doubt but that such a work as he contemplates would meet with more encouragement from the public of the present day, than fell to the lot of *Lepidóptera Británnica* in 1803. It is almost unnecessary to add that, as vast alterations in the nomenclature have taken place since that period, there should be in the new work a constant reference to the old. The glossary, also, of entomological terms, together with a set of explanatory figures, which, though never executed, formed a part of the original design, should by no means be omitted.

The present part contains a description of ten genera of minute moths, viz. Ermínea, Capillària, Dasýcerus, Chelària, Gracillària, Porrectària, Ypsólophus, Recurvària, Incurvària, and *Tínea*; the whole comprehending about 247 species. It is unnecessary to say more on this concluding part, as no doubt it will be in the hands of every entomologist who possesses or can procure the preceding volumes.

A. R. Y.

ART. III. *Floral Emblems.* By HENRY PHILLIPS, F.L.S. and F.H.S., Author of *Pomàrium Británnicum.* London. Col. pl. 1*l.* 10*s.*; plain 1*l.* 1*s.*

Sir,

I COULD wish that you had desired my opinion of any other work, rather than of that you have sent me. For several reasons I could wish this: first, because I admire that maxim, which recommends us, where we cannot say any thing favourable, not to say any thing at all; next, because it is awkward to point out the defects of others, while we are probably exhibiting our own at the same moment; and, lastly, because I am so naturally disposed to think well of, and to feel kindly towards, any person whose mind is accustomed to dwell among flowers and trees, that it is doing a personal unkindness to myself to speak as, in this instance, sincerity compels me to speak.

From the title of the work, *Floral Emblems*, I expected to see a neat little pocket volume, light as the subject of which it treated; or a thin quarto, with finely coloured plates, brought out altogether in a costly, and album-like style, and adapted to take its place among the elegant knick-knacks of a lady of fashion. I expected to have found in it the figures of such plants as have, either in this or any other country, been generally or poetically associated with certain ideas; together with some account of each, explaining where or with whom such associations originated; interspersed with appropriate quotations, and, occasionally, with interesting anecdotes. I fancied how agreeably many young ladies, who have more leisure than they know how to enjoy, would amuse themselves in tying up sentimental bouquets, and painting pretty devices; but when I saw the book, and when I read it (with very much more attention than I should have done, had you not desired my opinion of it), I was led to doubt whether there was any one class of persons with whom it was likely to become a favourite. Those ladies for whom it would seem the best adapted, and who might be supposed to welcome the sort of employment into which it might lure them, would, I suspect, find it troublesome to refer so frequently to its pages, to ascertain the signification of the various flowers; for many of them are so arbitrary and vague, that there is nothing to assist the memory in retaining them. They might receive the rose as the emblem of beauty; the lily, of innocence; the violet, of modesty or humility; the holly, of Christmas merriment; or the mistletoe, of a stolen kiss: these would be familiar to them. The author might reasonably expect them to receive, as importations from foreign lands, the rose, in progressive stages, as expressive of a growing love; the white water-lily, of unsullied purity; or the pomegranate, as the emblem of fertility; these, and many such, they might have received graciously, and Mr. Phillips might even have exercised his fancy in imagining new associations, so long as they were neither merely arbitrary, nor, in themselves, contradictory to the beauty and beneficence of nature. So long as the emblems he offered had a meaning and a grace, they might have been favourably received; but the majority of them appear to possess neither of these requisites. *Disdain* is to be expressed by the *Yellow Carnation:* Mr. Phillips does not tell us why; but goes on to speak of the vanity of the Greeks, and the arbitrary power exercised by their sultans, and ends with a quotation from Shakspeare, which is equally irrelevant. *Clématis* is symbolical of *Artifice;* for, " when artifice is innocently resorted to, for the purpose of giving pleasure, it may be compared to the agreeable fragrancy of the sweet Clématis." The comparison might be made with *any* fragrant flower; and it is not, perhaps, very often that artifice *is* "innocently resorted to." The *Sunflower* is indicative of *False Riches;* because " gold of itself, however abundant, cannot render a person rich, who is poor in spirit." Indeed! is wealth synonymous with magnanimity, in Mr. Phillips's vocabulary? It would be well if the *want* of gold were equally powerless to make those poor, whose spirits were *not* so. The *Blackthorn* represents *Difficulty:* " It is difficult to penetrate a thick fence of blackthorn; some persons make a difficulty of walking over a heath, others, who mistake impossibilities for difficulties, can only be *convinced* by *conviction*, which frequently comes too late." With the *Saffron* is associated the phrase, *Do not abuse.* " Too liberal a use of this cordial and stimulating flower is said to destroy the reason, or cause the death, of those who indulge in it." It may be my own dulness, but I do not see what reference the following quotation has, either to the plant, or to the author's mention of it: —

> " Some praise at morning, what they blame at night,
> But always think the last opinion right."

Neither do I find any sufficient reason for making the delicate *Privet* the emblem of *Defence* (the Holly would be a stouter one); the *Marjoram*, of *Bluster;* the *Osier*, of *Frankness;* the *Cereus* (one of the most beautiful of flowers), of *Horror*. Here I come to another objection, and a grave one: why does Mr. Phillips seek to associate flowers, which naturally present agreeable images to the mind as well as to the eye, with such ideas as these,—*Vulgar minds, Envy, Disgust, Voraciousness, War, Suspicion, Hatred,* &c.; and why does he represent the latter by the *Sweet Basil,* by a plant associated with the most tender love, as he may find in the works of Boccacio, and in two poets of our own times, neither of whom should have been forgotten, and, least of all, he whose body was too early laid to rest, to afford his great genius time for full expansion?

Why does Mr. Phillips represent *Celibacy* by a lady with eight husbands (Epilòbium angustifòlium), and one of the particular favourites of Flora, who is not supposed to advocate that virtue? Why make the *Lady's-smock* the emblem of *Paternal Error,* because Shakspeare says that Lear wore the *Cuckoo Flower* in his flowery crown; when, in the same page, he quotes lines from Shakspeare, designating the *Butter-cup* by that name, and expressly distinguishing it from the Lady's-smock? Why, speaking of the *Red Valerian,* does he quote a line applicable to a very different species? "Grey loosestrife here, and *pale* valerian spring." And why give the *common Laurel* as the emblem of *Glory,* instead of the *true Laurel,* the *Bay* (Laúrus nóbilis)? But it is vain to multiply questions (of which there are many more to ask), until these have been answered.

The language in which Mr. Phillips expresses his ideas, is as obscure and incorrect as the ideas themselves; one glaring instance of the latter, is the frequent misuse of the word *and.* "The language of flowers is said to be as old as the world, and the antiquity of floral emblems as great as that of love itself; *and* by whom it is supposed to have been invented," &c.

"That the use of heraldic emblems greatly increased throughout Europe, during the crusades, is generally known; *and* where, as a flattering badge, every private soldier wore a cross of red stuff, sewed to his surcoat."

"This month (January) *and the next* were added to the year by Numa Pompilius, and had the name from *Janus,* a Roman god, painted with two faces (signifying providence or wisdom), judging by things past of things to come."

Speaking of the Cýclamen, Mr. Phillips says: "We present this emblem, with a hope that the poets will not longer remain too diffident to let this pretty plant escape the harmony of their song," &c.

I wish I could find something to speak well of in this volume, but I am obliged to own that even the plates are bad. As a work of art, I am not qualified to speak; I refer only to the inaccuracy. The holly, in particular, is so little like a holly, that I said to a friend, as I looked at it, "This should have been a holly, but I see it is *not*." Upon reference, I was somewhat surprised to find that it was intended for one. The device representing *Pensiveness* arising from *Solitude*, has the situation of the plants exactly the reverse of what they ought to be. It now represents, according to Mr. Phillips's emblems, *Solitude* arising from *Pensiveness*.

Unless they were intended always to be represented by paintings, the party-coloured leaves must be rather difficult to obtain, as described; and it might happen that a lady might not have a bird's nest at hand, when she was desirous of sending to her lover a floral invitation to visit her in the months of *April* or *May*; or a caterpillar, should she fix upon a *Friday*.

One thing in the volume I did look at with some portion of interest, the floral emblems of the Scottish clans: but, in other respects, I have been disappointed; the more so, from a recollection of some interesting anecdotes, which I observed in a hasty skimming of the *Flòra Históric*a, some time since, and which had led me to expect similar entertainment in the *Floral Emblems*. E.

Art. IV. *An Introduction to Geology; comprising the Elements of the Science in its present advanced State, and all the recent Discoveries: with an Outline of the Geology of England and Wales.* By Robert Bakewell. The Third Edition, entirely recomposed, with new Plates, pp. 540, 8vo. Longman & Co.

Geology, or the science of the earth, has only been practically and scientifically cultivated for about half a century. What was formerly called geology, consisted of speculations respecting the formation of the world, which partook more of the character of poetry than of sound philosophy. Geology, as a science, can only proceed like the other sciences, by a patient investigation of facts, and by an extended comparison of analogous phenomena in various situations. Werner and some of the earlier practical geologists, who first examined attentively the structure of the earth's surface in the particular countries where they resided, fell into the very common error of forming premature generalisations, and took for granted that the same series of strata, and the same rocks, which they observed around them, were spread universally over the globe, in the same invariable order of succession. On this principle the system of Werner was founded, and its supporters maintained that it was perfect in all its parts, and was not less entitled to an unhesitating assent, than the Newtonian system of the universe. With the Wernerian system were mixed up various crude speculations, respecting the formation of rocks, which were in direct opposition to all the known properties of matter. Thus it was stated that the rocks and strata which form the surface of the globe, though composed of insoluble matter, were once all dissolved in the ancient ocean, and that this ocean after it had deposited a small part of its contents, was capable of supporting animal life. For some years after the commencement of the present century, the doctrine of Werner was (with a few exceptions) generally maintained in this country, and those who dared to dissent from it were considered as dangerous heretics. The Wernerian system derived much of its strength from the circumstance, that most geological writers went for their illustrations to Germany or countries more remote, and the reader had no opportunity of verifying or disproving their accuracy. The distinguishing character of Mr. Bakewell's *Introduction to Geology*, when it first appeared in 1813, was, that the illustrations of the principles of the science were chiefly taken from situations in our own island, which were accessible to the readers; he also openly attacked many of the glaring errors of the Wernerian system. The second edition contained a more ample account of English geology, and was favourably received both in this country and on the Continent; it was translated into German, and published at Friburg, the seat of Werner's labours and celebrity. The distinguishing character of the present enlarged edition of the *Introduction to Geology*, consists in the particular illustrations of geology, by comparisons of the rock formations in England with those in France, Switzerland, and Savoy, which the author has examined. It contains also a concise but clear account of the numerous discoveries of the bones of new genera and species of quadrupeds, found in the secondary and tertiary strata, which have recently given much additional interest to the study of geology.

The first chapter, which is introductory, treats chiefly on what may be regarded as belonging to Physical Geography: the form and density of the earth; the proportion of the land and water; and the great changes which the surface of the globe appears to have undergone, as indicated by the fossil remains of marine animals, imbedded in solid rocks at the height of many thousand feet above the present level of the sea. What the author particularly presses on the attention of the student is, the order in which the fossil remains are distributed, as proving that each stratum in which they are contained was once the uppermost solid part of the globe, and that the strata have been deposited in succession, at distant epochs. There is a note on the total quantity of salt contained in the sea, which we think curious and original. "The inquiry has often been made, whence did the sea derive its saline contents? It has been supposed, by some naturalists, that the salt in the sea has been gradually augmented by saline particles brought into it by rivers, but this cause is totally inadequate to explain the immense quantity of salt existing in the whole mass of the ocean. If the average depth of the sea be ten miles, and it contains $2\frac{1}{2}$ per cent of salt, were the water entirely evaporated, the thickness of the saline residue would exceed 1000 feet." (p. 9.) Our author proceeds to observe that, could this salt by any cause be removed and spread upon all the present continents, it would cover them with a stratum of solid rock salt, which would be more than half a mile in thickness.

The second chapter, On Petrifactions or Fossil Organic Remains, is new. The penetration of animal or vegetable substances with mineral matter, it appears from an experiment of the late Dr. Jenner (stated p. 31.), may be effected in a much shorter time than has been generally supposed; it is, therefore, from the nature of these organic remains, rather than from their state of preservation, that their high antiquity can be inferred. Mr. Bakewell adopts the Cuvierian classification of animals, and has given a succinct account of the geological distribution of fossil remains belonging to the four grand divisions which Cuvier has established in the animal kingdom. What the author conceives most particularly desirable is, to mark the first appearance of those orders of animals whose organisation proves that they existed under different conditions from the preceding orders. The animals, for instance, that possessed organs for moving on their bellies like the snail, and had heads and eyes, were the inhabitants of shallow waters or of rocks near the surface; and the first appearance of vertebrated animals with feet, indicates the existence of dry land or marshes in the vicinity, at the period of their existence.

Mr. Bakewell thinks that too much importance has been attached by modern geologists to the minutiæ of conchology. "We know so little," he observes, "respecting the forms or habits of the animals classed by the conchologist from their shells, that we are far from certain, whether many shells which are regarded as belonging to different species or even genera, are not mere varieties of form, occasioned by difference of age or situation. In animals which have no internal skeleton to determine their form, the construction of the external shell may probably admit of considerable variation, under a change of circumstances. In attempting to ascertain the identity of distant strata, we ought to bear in mind that there is another circumstance, independently of climate, that may have occasioned the same stratum to have been the abode or sepulchre of very different orders of animals. The depth of the ocean may have varied very much even in contiguous situations; and, in distant countries, the difference of depth may have been very great, and one part might support genera of pelagian animals (or those which live in deep seas), while a more shallow part might be tenanted by different genera or even orders of animals, whose organisation fitted them for moving nearer the surface of the water." Some naturalists seem delighted with forming new species from every slight variation in the form of the shell, and boldly pronounce, from such uncertain data, that fossil shells are different from existing species: this Mr. Bakewell thinks "to be not more wise, than it would be to class individual men as belonging to different species, on account of the different forms of their noses."

The remarkable fact, that no vestiges of human remains have been discovered with those of the more ancient inhabitants of the globe, is at present fully confirmed; nor have any fossil bones of monkeys been hitherto found. Our author, however, observes, that the vast diluvial beds of gravel and clay, and the upper strata in Asia, have not yet been scientifically explored, and both sacred and profane writers agree in regarding the temperate regions of that continent as the cradle of the human race.

Chapter 3., On the Mineral Substances that compose the Crust of the Globe, is nearly the same as in the former edition. Chapter 4., On the Principles of Stratification, is new and important. Every one who travels through a country for the first time, thinks himself competent to discover at one glance the direction and arrangement of the strata; but Mr. Bakewell observes, that it is often extremely difficult to trace the stratification correctly, and that many geologists who have enjoyed a high reputation, appear to have had very imperfect notions of stratification. M. D'Aubuison, in his *Traité de Geognosie*, published in 1819, has given examples of stratification which never did, nor ever could, occur in nature.

The curved stratification of the calcareous mountains of the Alps and Jura, and the optical illusions to which they give rise, are particularly described by Mr. Bakewell, and explained by diagrams.

Chapters 5 and 6., On the Rocks generally denominated Primary. This class Mr. Bakewell limits to granite, gneiss, and mica slate, and the rocks which are commonly associated with or imbedded in them. The three former rocks he regards as merely modes of the same substances, being essentially composed of the same earths, but different circumstances attending their formation have disposed them to assume a granitic structure in one part, and in another to separate into laminæ, or to take a slaty form. The indications of the present existence of subterranean fire beneath the granite of the Alps and of Auvergne in France, and, according to Humboldt, in the Andes, would, our author observes, render it probable that these rocks are of igneous origin; and the near connection there appears to exist between granite and other rocks allied to volcanic rocks, tends to confirm this opinion. The granite of the Alps, Mr. Bakewell states, rises in nearly vertical beds, which have been elevated, together with the secondary strata, after the formation of the latter; whereas, in some parts of England, the granite and the slate associated with it, though rising in elevated beds like those of the Alps, are covered by horizontal secondary strata, which must have *been deposited after the elevation* of the primary beds. Hence Mr. Bakewell infers that the granite of England is more ancient than that of the Alps. Two original sections are given; one explaining the structure of the Alps, and the other the structure of the granitic rocks and the secondary strata at Charnwood Forest, in Leicestershire, which will enable the reader to judge of the accuracy of the inference respecting their different ages.

Chapter 7., On Transition Rocks, or the lowest rocks in which organic remains are found. Mr. Bakewell observes that foreign geologists have not unfrequently classed the upper secondary strata with transition rocks, owing to the highly indurated and crystalline state in which the secondary strata occur, particularly in the Alps. Hence erroneous accounts have been given of the bones of vertebrated animals in transition rocks; whereas the rocks in which they are found are not more ancient than the English lias and oolite. Some interesting observations on the conformable transition rocks will be found at the end of this chapter.

Chapter 8., On the Regular Coal Formation; chapter 9., On Unconformable Rocks of Porphyry, Trap, and Basalt; and chapter 10., A Retrospective View of Geological Facts, contain many important illustrations of English geology; and, in the chapter on the coal strata, there are some observations on the search for coal in situations beyond the limits of the present known coal districts, which well deserve the attention of landed proprietors. The parts that relate to the original formation of coal in fresh-water lakes or marshes, will claim the attention of the speculative geologist. Chapters 11. to 13. describe the Upper Secondary Strata, from the magnesian limestone to chalk. The different formations comprised in this class were, till very recently, little studied either in this country or on the Continent. The transition rocks contain almost exclusively the remains of marine animals. The coal strata, resting upon the transition strata, contain almost exclusively the remains of vegetables, and occasionally strata with fresh-water shells. "A great change appears to have taken place in the condition of our planet after the deposition of the coal strata; for the upper secondary strata contain principally the remains of marine animals, and it is in these strata that the bones of vertebrated animals are first distinctly observed. Among these we find the bones of the mighty monsters of an ancient creation, whose extraordinary forms are still more astonishing than their immense magnitude. Some of these animals of the saurian or lizard tribe attained the length of forty feet or more, and appear, from the structure of the teeth and the organs of motion, to have united to the voracity of the crocodile, the power of darting through the water on their prey with inconceivable rapidity. Others had necks so long, that when extended out of the water they must have resembled immense hydras."

Much obscurity formerly prevailed respecting the classification of the secondary strata on the Continent. This Mr. Bakewell has attempted to unravel. He explains the points of resemblance and dissimilarity which exist between the magnesian limestone, the red marl, and lias of England, and the zetchstein, the grès bigarré, the calcaire à greyphites, and the muschelkalk of the Continent. Mr. Bakewell states that the lower part of the lias is wanting in the English strata, and that the grès rouge ancien, the grès des vosges, and the grès bigarré of the French, are only the lower, middle, and upper parts of the red marl and sandstone, which are more fully developed in France than in England. The difference between the French and English formations of red marl and lias is not greater than what exists in distant parts of the same formation in England. Our author has also traced the identity of the English lias and oolites, with the calcarean formation of the Jura and the Alps.

A series of fresh-water strata, between the oolite and the chalk, occurs in the southern counties of England; but these are probably local formations; they are remarkable for containing the remains of an herbivorous animal of the lizard family, seventy feet in length. Our limits will not permit us to dwell on chapter 13., which describes the Chalk Formation. Chapter 14., On the Tertiary Formations, above the chalk strata, is new. The existence and extent of the tertiary strata, in Europe, were, till recently, imperfectly known. It is in these strata that we first meet with the bones of large mammiferous quadrupeds, which belong to genera or species no longer existing on the globe. In these strata we also find the alternation of the remains of marine animals with beds that contain exclusively the remains of land and fresh-water animals, which indicate that a great portion of Europe has alternately been covered by the sea, and by fresh-water lakes. In England the tertiary formations are imperfectly developed; the extent which they cover, in this country, is marked on the geological map that accompanies the present volume; under the map there is a small section of the vale of Thames, which shows the arrangement of the tertiary beds, over the chalk, in the vicinity of London.

Chapters 15, 16., On Volcanoes and Volcanic Rocks; and on the agency of subterranean fire in the formation of rocks and strata. In these chapters we have a succinct account of volcanic phenomena, and a comparison between ancient and recent volcanoes. In a former state of our planet (Mr. Bakewell observes) the internal fire must have been more intense than since the records of authentic history; this is shown by the remains of ancient craters, which far exceed the magnitude of any that are active at the present time; and the craters being formed by the eruption of volcanic matter, their size bears evidence of the magnitude of their former operations. The enormous craters, many leagues in extent, had, doubtless, an important office to perform in nature; and it cannot, our author observes, be unreasonable to infer that the earth is the great laboratory, where the materials were prepared that form its surface, and were thrown out either as melted lava, or in aqueous solution, or in a gaseous state, &c. Siliceous earth is found in hot springs; and hence, he says, we may infer that many siliceous rocks and veins were deposited by subterranean waters at a high temperature. This opinion, which was advanced by Mr. Bakewell in his second edition in 1815, has recently been adopted by that eminent geologist, M. A. Brongniart. The following chapters, On Metallic Beds and Veins, and On Diluvial and Alluvial Depositions; and chapter 19., On the Formation of Valleys, and on Deluges and Denudations, are replete with interesting matter, which our limits will not allow us to notice. Chapter 20., On the Geology of England and Wales, contains a more distinct account of the secondary and tertiary formations, than was given in the second edition. Our author is inclined to believe that a range of primary mountains once extended, from east to west, across this country, of which the Charnwood Forest hills, the low sienitic hills in Warwickshire, and the Malvern hills in Gloucestershire and Herefordshire, are the remaining nuclei; and that these hills were once united, and opposed a barrier to the farther extension of the upper secondary strata; for beyond these hills the lias, oolite, and chalk, no where appear on the western side of England.

The present edition of this work contains one half more letter-press than the second edition; but are published at the same price, being printed in a smaller type.

A useful index and explanation of terms are added. From the clear manner in which the principles of the science were stated in the *Introduction to Geology*, and the variety of original information which it contained respecting the geology of England, it contributed much to the diffusion of a taste for geological enquiries in this country. The present edition contains all the principal discoveries that have since been made, and is replete with much valuable additional matter, derived from the author's extensive researches in Great Britain, and various parts of the continent of Europe. T.

Art. V. *Catalogue of Works on Natural History, lately published, with some Notice of those considered the most interesting to British Naturalists.*

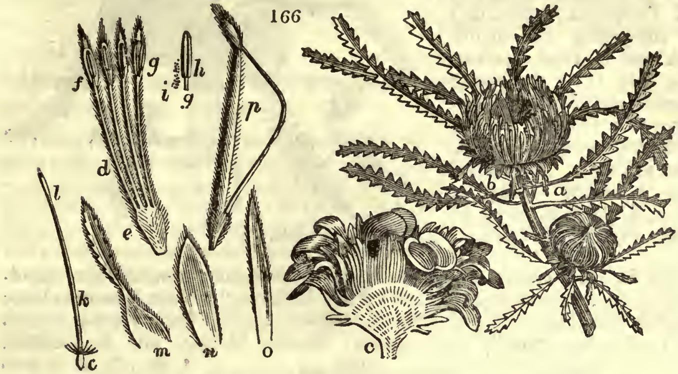
Britain.

Botanical Periodicals.

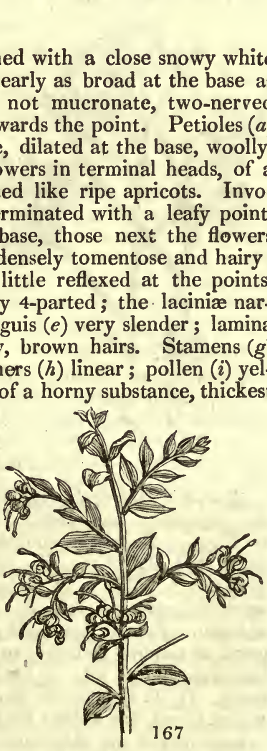
The Botanical Cabinet, for July, contains Catasètum Claveríng*i*. An orchideous plant, which roots into the decaying bark of the trunks of trees in the Brazilian forests, and is therefore called an epiphyte, in contradistinction to such plants as the mistletoe, which roots or fixes itself into the living bark. If our readers will bear this distinction in mind, they will be able to apply, with greater accuracy than is usually done, the words parasite and epiphyte.— *H*yoscy̆amus orientàlis; Pentán. Monog., and *S*olàneæ. A new herbaceous plant from Caucasus. It flowers in March and April; from which circumstance, the young botanist may conclude it to be of low growth; since plants of the herbaceous kind, which have to shoot up from the ground every year, before they flower, cannot, by March, have attained any great height.

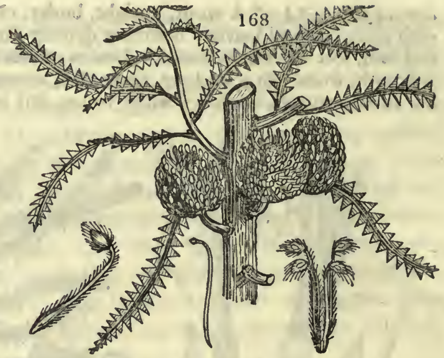
The Flòra Australásica, for July, contains Dryánd*ra* (Dr. Dryander, a celebrated and well known botanist) formòsa; Tetrán. Monog. and Prote-

àceæ. (*fig.* 166.) " A stout, upright, bushy, evergreen shrub, well clothed with branches and leaves: branches densely clothed with a soft tomentum, and long soft hairs intermixed. Leaves numerous, spreading, rigid, variable in length, from 4 to 9 in. long, pinnatifid, attenuated to the base, and ending in an acute point, hairy when young, but becoming smooth and glossy



by age on the upper side, underneath clothed with a close snowy white tomentum; lobes flat and flatly spreading, nearly as broad at the base as long, unequally sided, triangular, acute, but not mucronate, two-nerved underneath, the margins slightly recurved towards the point. Petioles (*a*) nearly flat, a little convex on the lower side, dilated at the base, woolly, also clothed and fringed with long hairs. Flowers in terminal heads, of a rich orange brown, very handsome, and scented like ripe apricots. Involucre (*b*) of numerous bractes: outer ones terminated with a leafy point, becoming broad and thickened towards the base, those next the flowers terminated in a sphacelate recurved point, densely tomentose and hairy; inner bractes linearly oblong, acute, also a little reflexed at the points. Receptacle (*c*) chaffy. Perianthium (*d*) deeply 4-parted; the laciniæ narrow, thickly clothed with long soft hairs; unguis (*e*) very slender; lamina (*f*) concave, densely clothed with long, glossy, brown hairs. Stamens (*g*) 4, inserted in the hollow of the lamina; anthers (*h*) linear; pollen (*i*) yellow. Style (*k*) smooth and glossy, rigid, and of a horny substance, thickest at the base, and tapering upwards, straw-coloured. Stigma (*l*) simple, green, ending in scarcely an acute point." *m*, One of the outer bractes of the involucrum, terminated in a leafy point. *n*, One of the inner broadish ones. *o*, One of the inmost linear ones. *p*, Perianthium split on one side, showing the style escaping in a bent direction. — Billardièr*a* (in honour of J. J. Labillardiere, the celebrated French naturalist, who accompanied the expedition in search of La Peyrouse) scándens; Pentán. Pentag., and Pittospòreæ. A small climbing shrub, which produces one of the very few eatable fruits that are natives of New Holland, and even this fruit is not very agreeable to the palate. — Grevíll*ea* acuminàta (*fig.* 167.) A handsome shrub, with singular flowers, from the moun-





tains in the vicinity of Port Jackson. — Bánks*ia* (Sir Joseph Banks) dryandrö*ides* (Dryandra, and *eidos*, like; a Bánks*ia* resembling a Dryándr*a*); Tetrán. Monogýn., and Proteà*ceæ*. (*fig.* 168.) By comparing this figure with that of Dryándr*a* formòsa (*fig.* 166.), the young botanist will be able to distinguish a Bánks*ia* from a Dryándr*a* whenever he sees them in flower. The difference is in the receptacle, which, in Bánks*ia*, forms an amentum, while in Dryándr*a* it is a chaffy disk.

The British Flower-Garden, for July, contains some new and very handsome plants. Cummíng*ia* (named by Mr. G. Don, "in compliment to Lady Gordon Cumming, whose attachment to the science of botany justly entitles her to this distinction") campanulàta; Hexán. Monog., and *A*sphodèleæ. (*fig.* 169. *a*) A bulb from Peru, with grassy leaves, and elegant blue flowers. Salpiglóssis (*salpigx*, a trumpet, *glossis*, a tongue; flowers trumpet-shaped, and style tongue-shaped) picta; *S*olàneæ. A magnificent herbaceous plant from Chile, first raised in the garden of P. Neill, Esq., our much valued correspondent, at Cannon Mills, near Edinburgh. — Magnòl*ia* Soulang*iàna* is a splendid hybrid production, raised by the Chevalier Soulange-Bodin, between M. conspícua (the M. *Yùlan* of Decandolle) and M. *Kòbus*.

The Scientific Journals.

Brande's Quarterly Journal, for June, contains some interesting papers, but especially one, entitled Illustrations of Nature, or the Arrangement of Physical Existence, indicated in Outline, by G. T. B. The writer maintains that the three kingdoms of nature are "arbitrary and incorrect divisions." This is so contrary to the common sense of mankind in all ages and countries, that the writer cannot hope for many converts to his opinion. But all great and general views, all comprehensive theories, are good, as tending to cultivate the higher powers of the mind. A good deal has been said of late in favour of the quinary, septenary, and circular systems. G. T. B. suspects the "trine distribution" to be universally prevalent; and, for having had his attention directed to this principle, he acknowledges his obligation to *Tritogenea*, the philosophic work of Mr. George Field. After three or four pages of discussion, the following tabular view is given: —

Realms.	Reigns.	Regions.	Classes.
Spiritual	Rationals	Lung-breathing	Beasts. Birds. Reptiles.
Vital	Animals	Gill-breathing	Fish. Fish allies, or Mollúsca. Shell Fish, or Crustàcea.
Inorganic	Vegetàlia	Skin-breathing	Insects. Worms. Plant allies, or Zoophytes.

There is a paper on the proceedings of the Royal Institution, which shows the prosperous state of that body. A great number of lectures, on very interesting subjects, have been delivered and numerously attended, much interesting discussion has taken place, and a great variety of curious, historical, or useful objects exhibited at the weekly evening meetings. From the collections in natural history, we learn (extract from *Ann. Linn. de Paris*) that plants with pointed leaves and spines attract electricity; that electrified seeds pass more rapidly through the first periods of vegetation, than such as are not electrified; and that electrified roses flower more rapidly and abundantly.

The Philosophical Magazine, for July, possesses its usual interest; that for August contains a paper from the *Philosophical Transactions* for 1828, part i., by Sir Humphrey Davy, in which volcanic fires are accounted for by the exposure of the metals of earths and alkalies to air and water, and also the formation of lavas and basalts, and many other crystalline rocks, explained from the slow cooling of the products of such combustion.

Gill's Technological Repository, for July, contains an animated article on the delight and instruction which flow from the study of natural history, "whenever it is pursued, not merely in a scientific, but in a truly philosophical spirit," taken from *Blackwood's Magazine*. "In speaking of the effect of such studies on the temper of the mind, in tranquillising it, we cannot help noticing the natural calmness, independent of those other affections which attend such studies, arising out of the very nature of the objects themselves, about which the naturalist is occupied, and out of the manner in which he is occupied about them." In the August Number is the continuation of Mr. Carpenter's experiments with the microscope on insects and their eggs, and a paper on the Ichneumon Fly, by Mr. Carpenter. "There are several species of ichneumon which make thinnings among the caterpillars of the cabbage butterfly. The process of one species is this: while the caterpillar is feeding, the ichneumon fly hovers over it, and, with its piercer, perforates the fatty part of the caterpillar's back in many places, and in each deposits an egg, by means of the two parts of the sheath uniting together, and thus forming a tube down which the egg is conveyed into the perforation made by the piercer of the fly. The caterpillar, unconscious of what will ensue, keeps feeding on, until it changes into a chrysalis; while in that torpid state, the eggs of the ichneumon are hatched, and the interior of the body of the caterpillar serves as food for the caterpillars of the ichneumon fly. When these have fed their accustomed time, and are about to change into the pupa state, they, by an instinct given them, attack the vital part of the caterpillar (a most wonderful economy in nature, that this process should be delayed until they have no more occasion for food). They then spin themselves minute cases within the body of the caterpillar; and instead of a butterfly coming forth (which, if a female, would have probably laid six hundred eggs, thus producing as many caterpillars, whose food would be the cabbage), a race of these little ichneumon flies issues forth, ready to perform the task assigned them, of keeping within due limits those fell destroyers of our vegetables." (p. 84.)

The spider also is attacked by the ichneumon, and a small fly, whose larva is very destructive to the grains of wheat, is also said to be kept within due limits by the same insect. The caterpillars of the magpie moths, which feed on currant leaves, those of the moth which feeds on bent grass and ribwort, and probably various other caterpillars, are liable to become their nidi. One species lives on the aphides which infest the rose tree, and Mr. Carpenter saw a large species of ichneumon come forth from the chrysalis case of a fly of the genus *M*úsca. It appears that different species of ichneumons sometimes deposit their eggs in the bodies of the same caterpillar, and that many of the cynips, or gnats, which breed within the dog-rose and oak apples, are destroyed by ichneumons depositing their eggs within the cells of the cynips, and Mr. Marsham, as we are informed by Mr. Samouelle, in his very valuable work, *The Entomologist's Useful Compendium*, observed in Kensington Gardens, in June 1827, the *I*chneùmon manifestàtor on the top of a post, depositing its eggs in the holes of the wild bee (*A*'pis maxillòsa), and, no doubt, in the larva or young bees which were in these holes.

Brewster's Journal, for July, contains a great variety of interesting information on subjects of natural history. The first article, by J. Grant, Esq., on the Ourang-outang of Borneo, is very curious and interesting. Its face is said to be strangely human; "nor is it in his physiognomy alone that this animal bears so much resemblance to the human being." In a considerable number of points it differs from the other species of apes, and in all of these points it differs by approaching to the human species. The creature may be tickled, and laughs, and walks upright. He is, however, only 2 ft. 2 in. high, and weighs but 22 lbs. avoirdupois. A number of other curious particulars we have extracted for our Collèctanea.

Jameson's Philosophical Journal, for June, contains, as usual, a number of valuable papers; among others, the conclusion of the Geology of Nithsdale, by our correspondent, J. S. Menteath, Esq. jun., formerly noticed (p. 171.) as important in an agricultural point of view. He remarks that the Scotch fir (*P*ìnus sylvéstris) does not harden its wood well, when growing on the greywacke; but that the contrary happens with the larch (*P*ìnus *L*àrix), its wood being sound and good, and perfect at the heart. "The larch grows naturally only on the primitive mountains, as the granite, gneiss, and the like rocks of that class of the Alps, in Switzerland. And it is most curious to observe, that, on the whole range of the Jura mountains, separating that country from France, and being a limestone formation, rising to an elevation of several thousand feet, not a single self-sown larch can be discovered." Advancing, however, from this range into Switzerland, where the primitive formation abounds, we find the larch indigenous, and attaining to a great size. "It would thus appear that the greywacke, approaching very near in qualities to the primitive mountain soil, is the best qualified to grow larch." The author is of opinion that, "when mineralogy, a science so interesting to the philosopher, comes to be more generally understood and applied to the discovery of useful mineral substances, we may expect that this tract will furnish products not yet brought to light, which may contribute to promote agricultural and manufacturing industry; and the valley of the Nith, though not the most extensive, may become one of the most important that is anywhere to be met with in Scotland."

Report of the Committee of the Portsmouth and Portsea Literary and Philosophical Society. 1827–8. Portsmouth. Pamph. 8vo, pp. 48.

This is one of the most prosperous provincial societies in the kingdom; and, in such a place as Portsmouth, where there are so many young men whose active pursuits allow them little leisure for reading, it must be the cause of much good, by directing their attention to those subjects by which they can best render service to science. The effects in this way are obvious, from the great number of donations annually made to the museum by naval officers. "In these commercial and maritime towns, the number of individuals possessed of literary leisure is necessarily limited. Hence the greater importance of facilitating their improvement; of communicating knowledge in an attractive form, whereby the mind is imperceptibly led to the acquisition of knowledge; of divesting science of many of those technicalities which frequently prove insuperable difficulties to the student. The members of this Society are generally impressed with its usefulness; and, if this Report should happen to circulate beyond our own immediate sphere, it is trusted that it may have some effect in exciting the uninterested, and arousing the lukewarm, in the cause of science. This Society does not advocate the interest of any sect; it proceeds on the broad principle of doing good, not to particular individuals, but to the public at large; not to any party, but to the inhabitants of these towns in general."

The Report of the Committee from which these extracts are taken, is followed by the Secretary's Report, in which the analysis is given of the different lectures delivered throughout the year. The interest of these lectures, and the good which they are likely to effect, will appear from the following enumeration of the subjects of them: — Natural Philosophy, by Mr. John Fincham, Vice-President; Geology of the Island of Portsea, by Lieut. Davies, Curator of the Museum; Stenography, by Mr. Hinton, of Chichester; Mechanical Properties of the Atmosphere, by the Rev. J. Fullagar, President of the Mechanics' Institution of Chichester; Habits and Physiology of some of the *Vérmes* Testàcea, by Mr. C. Wilcox; Forensic or State Medicine, by Mr. J. W. Williams; Oxygen and hydrogen gases, by Mr. Richard Dowle; Mineralogy, by Mr. William Fricker; Philòsophy of Evidence, by Mr. N. Griffin; Physiology of the Stomach, and the Process of Digestion, by Mr. Garrington; Authenticity of the Poems of Ossian, by the Rev. Edmund Kell, A.M., of Newport; Progress of Literature in England, since the invasion of Julius Cæsar, by Mr. George Caught; Ichthyólites, or Fossil Remains of Fishes, by Lieut. J. H. Davies, Curator of the Museum; Languages, by Mr. Hinton, of Chichester; Anatomy and Physiology, by Mr. Julian Slight, Secretary; Hydrostatics, by the Rev. J. Neave; Contagion, by Mr. J. W. Williams; Magnetism, by Mr. Bennett, of Portsmouth Dock-yard; Probable permanency of Modern Civilisation, by Mr. George Caught; History of Music, by Mr. Henry Deacon, Treasurer; Electrical and Magnetic Agencies, &c., by Lieut. Sabben, R.N.

Waterton, Charles, Esq., of Walton Hall, near Wakefield; a man who, from a boy, has displayed great originality of character; an excellent classical scholar, and amiable in all the private relations of life: Wanderings in South America, the North-west of the United States, and the Antilles, in the years 1812, 1816, 1820, and 1824. With original Instructions for the perfect Preservation of Birds, &c. London, 8vo. 2d edit. 10*s*.

This is, in all respects, an original book; the remarks are, for the greater part, confined to subjects of natural history; and, mixed up as they are with the author's personal adventures, are not less entertaining than instructive. The future pages of our Collectanea will be richly indebted to Mr. Waterton. What is particularly gratifying in reading the work, is the liberality and benevolent feeling which it displays, not only towards man in every country and clime, and of every religion and government, but towards every living thing capable of feeling pain or enjoying pleasure. The book deserves to be put into the hands of all boys resident in the country, to teach them the exercise of humanity, in their earlier years, towards insects and birds, and, in their more mature days, in the sports of the field and in the chase. We cannot sufficiently recommend it.

Hart, Mr. *Edmund:* Philosophical Enquiries; or, an Examination and Refutation of most of the received Theories of Rain, Mist, Dews, Latent Heat, Solar Rays, Light, and Lunar Influences; a Plan for preventing Thunder and Hailstones; together with Drs. Herschell and Clarke's Weather Table, &c. &c. In a Series of Letters. London. 12mo, pp. 84.

Sebright, Sir *John Saunders*, Bart.: Observations upon Hawking, describing the Mode of Breaking and Managing the several kinds of Hawks used in Falconry. London. Pamph. 8vo, pp. 64. *3s. 6d.*

Before the appearance of this little tract, we were not aware that so much of this ancient amusement of our princes still remained in the kingdom. In the olden time a falconer was an indispensable personage in the establishment of a nobleman; but the invention of gunpowder, and improved machines of destruction, have almost banished the falconer, together with his occupation. The little work before us will, however, in some degree, retrieve the sinking fame of this once fashionable amusement, as it shows that training birds of prey for sport or use is perfectly practicable, and that, as instruments of the chase, they are as effectual, and, at the same time, just as rational, as the slaughtering gun, and certainly less dangerous.

Sir John informs us that professional falconers have been for many years natives of the village of *Falconsward,* near Bois le Duc, in Holland. A race of them was there born and bred, whence supplies have been drawn for the service of all Europe: but, as there has been no sufficient inducement for the young men to follow the employment of their forefathers, numbers are dead or worn out; and there only remains John Pells, now in the service of John Dawson Downes, Esq., of Old Gunton Hill, Suffolk.

The author has very accurately detailed the best method of taking, rearing, and training the hunting hawks, with all the terms of falconry, including feeding, tiring, &c.; and also given concise descriptions of their game, and directions for using them in the pursuit of it.

The hawks enumerated by Sir John, which have been trained for the field, are the slight falcon (Fálco gentìlis) and the goshawk (Fálco *p*alumbàrius), which are the species generally used in falconry. The former is called a long-winged hawk, or one of the *lure;* the latter a short-winged hawk, or one of the *fist.*

The Icelander is the largest hawk that is known, and highly esteemed by falconers, especially for its great powers and tractable disposition. The gyr falcon is less than the Icelander, but much larger than the slight falcon. These powerful birds are flown at herons and hares, and are the only hawks that are fully a match for the fork-tailed kite. The merlin and hobby are both small hawks, and fit only for small birds, as the blackbird, &c. The sparrow-hawk (Fálco *N*ìsus) may be also trained to hunt: his flight is rapid for a short distance, kills partridges well in the early season, and is the best of all for landrails.

Partridge, magpie, heron, and rook hawking are described, and in a way which must be interesting to every sportsman.

Sir John asserts, that "the slight falcon takes up his abode every year, from October and November until the spring, upon Westminster Abbey, and other churches in the metropolis. This is well known to the London pigeon-fanciers, from the great havoc they make in their flights."

The fork-tailed kites were much flown, some years ago, by the Earl of Orford, in the neighbourhood of Alconbury Hill.

France.

Saint-Hilaire, Jussieu, and *Cambessèdes:*

1. Plantes usuelles des Brésiliens. Paris. 4to, livr. 13. fig. *5s.*
2. Flora Brasiliæ Meridionalis. Paris. Fascic. 7. 4to, fig. 1*5s.*; folio, fig. col. *3l.*

Descourtilz: Des Champignons comestibles suspects et veneneux, &c. Paris. 8vo, livr. 6. and 7. col. pl. fol. *3s.*

De Candolle: Botanicon Gallicum, seu Synopsis Plantarum in Florâ Gallicâ descriptarum. Edit. 2nda ex herbariis schedisque Candollianis et suis digestum a Duby. Pars 1ma plantas vasculares continens. Paris. 8vo. 12*s.*

Guillemin: Icones Lithographicæ Plantarum Australasiæ rariorum. Decades duæ. Paris. 4to. *6s.*

Duperrey:

1. Voyage autour du Monde pendant les années 1822–25. Seconde divis.; Botanique. Paris. Folio, livr. 3. 14*s.* each.
2. Voyage autour du Monde, pendant les années 1822–25. Première division; Zoologie. Paris. Folio, livraison 6. 14*s.* each.

Freycinet: Voyage autour du Monde pendant les années 1817–20. Ve. partie; Botanique, 6me livraison. Paris Folio. 14*s.* each.

Duponchel: Histoire Naturelle des Lépidoptères Nocturnes de France. Paris. 8vo, tom. 4. livr. 5–7. *3s.* each.

Cours d'Histoire Naturelle, contenant les principales espèces du Règne Animal, dessinées par Paul Oudart, publié par Engleman. Paris. 4to, livraisons 1 à 12. Plain, 4*s.*; coloured, 8*s.* each.

Planches de Seba, accompagnées d'un texte explicatif mis au courant de la Science, et rédigé par une réunion de savans, Baron Cuvier, Desmarest, Geoffroy Saint-Hilaire, &c. Paris. Folio, livraisons 7 à 12. 4*s.* each. (To be completed in 45 livraisons.)

Robineau Desvoidy: Récherches sur l'organisation vertébrale des Crustacés, des Arachnoides, et des Insectes. Paris. 8vo.

MM. *Audouin, J. Bourdon, &c.:* Dictionnaire Classique d'Histoire Naturelle dirigé par Bory de Saint Vincent. Paris. 8vo, tom. 12, 13. avec cahiers 12, 13. de Planches. 13*s.* per vol., with plates.

Polydore Roux: Ornithologie Provençale, ou Description avec fig. color. de tous les oiseaux qui habitent constamment la Provence, ou qui n' y sont que de passage. Marseilles. Livraison 1–12. 7*s.* 6*d.* each. (To form 50 livraisons.)

Fellens: Manuel de Météorologie, ou Explication théorique et demonstrative des phénomènes connus sous le nom des météores. Paris. 18mo. 4*s.* 6*d.*

Dictionnaire des Sciences Naturelles. Paris. 8vo, tom. 52, 53. 6*s.* each; Planches, cahiers 52, 53. 5*s.* each

Lesson: Complément des Œuvres de Buffon, ou Histoire naturelle de tous les animaux rares et précieux, découverts depuis la mort de Buffon. Paris. 8vo, tom. 1. 3*s.* 6*d.* Planches noires, livraison 1. 2*s.* 6*d.*; col. 5*s.* (To form 10 volumes, and 20 livraisons of plates.)

Joseph, J. D., Anc. Capt. of Artillery: Essai sur les Modifications apportées à la conformation de la terre depuis sa création. Paris. 8vo, pp. 80.

Boitard, M.:

1. Manuel d'Entomologie, ou Histoire naturelle des Insectes. Paris. 2 vols. 18mo, pp. 435 and 417. pr. 7 *fr.*
2. Atlas des Insectes nécessaire pour l'intelligence du texte, composee de 110 planches. Paris. Plain, 17 *fr.*; col. 34 *fr.*

Girardin, J., and *Juillet, Jul.:* Nouveau Manuel de Botanique, ou Principes élémentaires de physique végétale, contenant l'Organographie, la Physiologie, la Taxonomie, et la Description de cent quatre-vingt-treize familles naturelles connues. Paris. 18mo, 12 pls. 5 *fr.* 60*c.*

Germany.

Palm, Dr. *L. H.:* Uber das Winden der Pflanzen Eine botanisch-physiologische Preisschrift. On the twining of Plants. A botanical physiological Prize Essay. Stuttgard. 8vo. 3*s.* 6*d.*

Bischoff, G. W.: Die Kryptogamischen Gewächse mit besonderer Berucksichtigung der Flora Deutschlands und der Schweiz. On cryptogamous plants, particularly of the Flora of Germany and Switzerland. 1st book. Nuremberg. 4to. 12*s.* 6*d.*

Weberi, G. W.: Nolte, Novitiæ Floræ Holsaticæ, sive Supplementum alterum primitiarum Floræ Holsaticæ. Hamburgh. 8vo. 9*s.* 6*d.*

Schwaegrichen, F., &c.: Johannis Hedwig, &c., Species Muscorum Frondosorum descriptæ et tabulis æneis illustratæ; opus posthumum, supplementum secundum. Leipsic. 4to, pp. 79. 6 *thal.*

Glocker, E. F.: De Gemmis Plinii, imprimis de Topazio. Oryctologiæ Plinianeæ specimen primum. Breslaw. 8vo, pp. 74. 8 *grs.*

Steinmann and *Reuss:* Das Saidschitzer Bitterwasser. The mineral waters of Saidschitz in Bohemia. Prague. 8vo, pp. 129.

Goeppert, H. Rob.: De Acidi Hydrocyanici vi in Plantas Commentatio. Breslaw. 8vo, pp. 58.

Italy.

Gussone, Joanne: Floræ Siculæ Prodromus, sive Plantarum in Sicilia ulteriori nascentium Enumeratio, secundum Systema Linnæanum. Naples. 2 vols. 8vo, pp. 592.

Holland and the Netherlands.

Lejeune, A.L.S., and *Courtois, R.:* Compendium Floræ Belgicæ. Liege. 1 vol. 12mo, pp. 264. 2 *florins.*

Sweden.

Svensk Zoologi. Zoology of Sweden, published by the Royal Academy of Sciences. Stockholm. Vol. 2. cah. 12. 8vo, pp. 155, with plates.

Nillson, S.: Petrificata Suecana formationis cretaceæ descripta et iconibus illustrata. Part 1. Vertebrata et Mollusca sistens. Lund. Folio, pp. 39, 10 pl. gr.

PART III.

COLLECTANEA.

Art. I. *The General Subject.*

Test of a good Naturalist. — It was the opinion of Linnæus, that the superiority of a naturalist depends upon his knowledge of the greatest number of species; and, considering the character of his works, as filled with brief, dry, technical descriptions of genera and species, arranged in artificial, unnatural groups, somewhat after the fashion of an index, the opinion is not much to be wondered at, though few naturalists, we think, of the present day would covet the distinction, apart from other qualifications of a higher order. A good gossiping naturalist might, no doubt, be made, by storing the memory with Linnæan names and distinctions; but, by making these the chief study, all comprehensive and philosophical views of nature would be frittered down into an endless and useless crowd of unarranged ideas, like the disunited and scattered links of what ought to form a beautiful and magnificent chain. It is indeed one of the most prominent marks of a vulgar and uneducated mind, to associate ideas slenderly connected, and to be deficient in the power of grouping important facts, and of bringing them into a luminous focus, as must be always the case with a *mere knower* of species. I cannot better illustrate the character of such gossiping naturalists, than by quoting Dame Quickly's speech to Sir John Falstaff, in *Henry IV.*, which is full of circumstances quite irrelevant and unconnected.

" *Hostess.* Thou didst swear to me upon a parcel-gilt goblet, sitting in my Dolphin chamber, at the round table, by a sea-coal fire, upon the Wednesday in Whitsun-week, when the prince broke thy head for likening his father to a singing-man of Windsor; then didst thou swear to me, then, as I was washing thy wound, to marry me, and make me my lady thy wife. Canst thou deny it? Did not goodwife Keech, the butcher's wife, come in then, and call me gossip Quickly, — coming in to borrow a mess of vinegar; telling us she had a good dish of prawns; whereby thou didst desire to eat some; whereby I told thee they were ill for a green wound? And didst not thou, when she was gone down stairs, desire me to be no more so familiarity with such poor people?"

My test of a good naturalist, on the contrary, would be taken from the power of combining a number of important facts into connected groups, so as to establish useful general conclusions. A short example of what I mean will be found in the extract from Wilson, respecting feline animals (p. 371.). — *J. Rennie.*

Technicalities of Science. — The inutility of science, written in a merely technical form, is well exemplified in the instance of Cicero. He was advised by his friends not to write his works on Greek Philosophy in Latin; because those who cared for it would prefer his work in Greek, and those who did not would read neither Greek nor Latin. The splendid success of his *De Officiis*, his *De Finibus*, his *De Natura Deorum*, &c., showed that his friends were wrong. He persevered in the popular style, and led the fashion. — *Id.*

Devotion to Nature. — The Headland of Tarbet, which seemed " so threatening overnight, now most desirably cuts us off from every connection with the low land. Nature, always lovely in detail, was now sublime in her *tout ensemble.* Every thing about us proclaimed a power which penetrated to the very centre of our being. Nature was here every thing, man nothing, except as he was filled with the grandeur and wonders of nature. The curtain of the world seemed withdrawn; and, without any formality of worship, our hearts paid a grateful homage to the Great Architect who had prepared such a magnificent spectacle." (*Letters from the Highlands, by W.*, in *Scotsman*, April 16.)

Classification. — First thoughts on most subjects are often right, because they are the impulse of natural feeling; succeeding thoughts are exercises of reason, and are sometimes right and sometimes wrong. For a while man is best pleased with his own systems, because he understands them best; afterwards he begins to discover something of the system of nature, and ultimately he returns to his first feelings, and endeavours to cultivate them. Thus, in the study of botany and zoology, the early authors arranged plants and animals according to their more obvious appearances and resemblances; afterwards they had recourse to particular parts of individuals, as the flowers, leaves, &c., of plants, and the teeth, feet, &c., of animals. After a great number of such artificial systems have been tried, modern botanists and zoologists have adopted what is called the natural system, or classification according to the aggregate of resemblances, which is nothing more than a return to the manner of looking at objects, and classing them, adopted instinctively by every human being. — *C. N.*

The Study of Natural History. — There are few studies better calculated to expand the mind, and gratify our natural thirst of knowledge. The gradation and inter-approximation of animal forms, amid whose countless variations a relation to a given standard can be traced, to one common and original type; the intimate relation between organised beings and the local circumstances by which they are surrounded; the structure of peculiar organs which necessitate a modification of all the others, and fix irreversibly the habits and mode of existence of the animal; the varieties produced by accidental causes, and the grand and permanent distinctions, whose preservation has been guarded by jealous nature with impassable barriers; the proportionate developement of the intellectual principle following the varieties of organisation; and, in fine, the astonishing results of that mysterious cause, which our ignorance has termed instinct: all these are surely subjects of the highest interest, and constitute the essential province and peculiar charm of zoology. The writers who unfold them are deserving of the gratitude and admiration of mankind, as much as those who employ themselves in disguising and degrading the science, by a cacophonous nomenclature, and a parade of barbarous Latinity which fools think learning, are entitled to reprobation and contempt. There are many such in France, and some among ourselves, great men in their little circles; they do well to make the most of this; for they may rest assured, that however highly they may rank in their own estimation, or in that of their coteries, the world neither knows nor cares any thing about them. (*Athenæum,* April 8. p. 341.)

Spontaneous Organisation of Matter. — We have before (p. 65.) stated the opinion of M. Bory on this subject. M. Dutrochet has endeavoured to show that the green matter floating about in stagnant waters, as well as the microscopical animalcula found in water in the summer season, is nothing more than gelatinous matter, altogether inanimate, but influenced by electrical currents. With respect to the green matter, J. Rennie, in the *Verulam,* says, " we are certain of the fact, that the green matter which forms on stagnant water is precisely the same with that which forms on walls of stone, brick, or cement; and that it is not related to Býssi and Conférvæ any more than to animalcula, but is simply the germination of the more common mosses (*Tórtulæ*, *Hýpna*, *Polýtricha*, &c.), which, for want of proper soil to support their vegetation, never get beyond what is in them analogous to the seed-leaf in cotyledonous plants."

Art. II. *Zoology.*

Musical Ear. — "I knew, at Paris, the widow of an Irish patriot, who could not hear the 'Exile of Erin' sung, without being overpowered to such a degree, that it would have been truly alarming, had not a flood of tears come to her relief. What is wonderful, so far from having a fine musical ear, she had not even a commonplace relish for music. The same effect was produced on her by the 'Minstrel Boy' of Moore. P., a young friend of the writer, who has no taste for music, is similarly overpowered, even in a crowded theatre, when 'Home, sweet Home' is sung." (*London Magazine.*)

Characteristics of Feline Animals. — Animals of the cat kind are, in a state of nature, almost continually in action both by night and by day. They either walk, creep, or advance rapidly by prodigious bounds; but they seldom *run*, owing, it is believed, to the extreme flexibility of their limbs and vertebral column, which cannot preserve the rigidity necessary to that species of movement. Their sense of sight, especially during twilight, is acute; their hearing very perfect, and their perception of smell less so than in the dog tribe. Their most obtuse sense is that of taste; the lingual nerve in the lion, according to Des Moulins, being no larger than that of a middle-sized dog. In fact, the tongue of these animals is as much an organ of mastication as of taste; its sharp and horny points, inclined backwards, being used for tearing away the softer parts of the animal substances on which they prey. The perception of touch is said to reside very delicately in the small bulbs at the base of the mustachios. (*Wilson's Illustrations of Zoology.*)

Food of the Humming-Bird. — From the circumstance of humming-birds frequenting flowers, and thrusting their needle-formed bills into the blossoms, as bees and butterflies do their suckers (haustella), it has hastily been concluded by naturalists, that, like these insects, they feed on honey. But if such naturalists had paused for a moment to consider the form of the bill and the tongue in the *T*rochilìdæ, their conclusions would not perhaps have been so hasty. The trophi of insects which feed on the honey of flowers, are beautifully adapted for procuring it by suction, which is commonly indispensable, the honey being in most cases spread thinly over the surface of the nectary or the ungulæ of the petals, and not in quantities such as it might be drank like water. Now it is a fact, which is or may be well known, that birds have almost no power of suction, in consequence of the narrowness and rigidity of their tongue, as may be seen when they drink, having to hold up their heads and depend upon the weight of the water for transmitting it into the craw. Nobody, as far as we know, has described the humming-bird drinking the honey from flowers in this manner, and indeed its tenacity and glutinous nature would entirely preclude this. Such reasons would dispose us, therefore, to conclude, that the *T*rochilìdæ do not feed on honey, though we did not possess irresistible proofs of the fact, that they feed on insects.

Wilson, the distinguished author of the *American Ornithology*, found, upon repeated dissection, that the *T*róchilus cólubris had a quantity of insects in its stomach, either whole or in fragments; and the eccentric Waterton affirms that humming-birds feed on insects. Of course, they frequent flowers not for their honey, but to prey upon the insects which are in pursuit of this honey. Were the requisite scrutiny gone into, it is probable that we should find all Latham's "Flower-eaters" (Anthóphagi) and Temminck's Nectarínize exclusively feeding on insects.—*J. Rennie.*

Mechanism of the Neck in Birds. — The contrivance by which the spine of animals is rendered susceptible of varied motion, is by means of a strong chain of bones (vertebræ), locked together by means of knobs and projections to prevent dislocation, a chain which stretches from the head to the extremity of the tail. Every body must have remarked, that in birds the neck is more capable of varied motion than in quadrupeds; but it is not so commonly known, that this can be accounted for from the greater number of bones, and consequently, of joints, in the necks of birds. Except in the three-toed sloth, indeed, the bones in the neck of quadrupeds and of man are uniformly seven in number, the short-necked mole having the same as the long-necked giraffe; in birds, the number is never less than nine, and varies from that to twenty-four: facts, which, we think, are as interesting as they are curious. — *Id.*

Varieties of Trout. — The late Professor Jurine, in his interesting *History of the Fishes of the Lake of Geneva,* has attempted to show that what are reckoned different species or varieties of trout (*S*álmo Trútta and *S. F*ário), and known under various names, such as the common trout, the salmon trout, the lake trout, the river trout, the Alpine trout, &c., are all referable to difference of sex, age, season, the nature of the waters, food, light, &c. The distinctive marks taken from the prolongation of the under jaw beyond the upper, the colour of the flesh, of the skin, with the size and shade of the spots, the form of the tail, &c., he found not to be permanent, and therefore not to be depended upon. (*Mem. de la Soc. de Physique et d'Hist. Nat. de Genève.*)

Migration of Fish.—The beluga (Accipénser *Hùso*), though an inhabitant of the Black Sea, is often caught at Presburg, 500 German miles from the mouth of the Danube. What shows that the migration is not solely for spawning is, that at the migrating season rivers abound in shoals of young fish incapable of spawning. May it not be, that the beluga swims against the stream to free itself from animalcula infesting the head? (*Taubo Beschreibung von Slavonien,* i. 29.) The salmon, Pennant tells us, is obliged to quit the sea to rid himself of the Lernæ`æ *s*almòneæ *L.*; and Dr. Anderson says they are driven back from the fresh water by another species of vermin.

Alligators swallowing Stones. — It is well known that many species of birds swallow small stones, for the purpose, as is supposed, of aiding digestion; but it is, we believe, an anomaly amongst other orders of animals. The following notice, accordingly, struck us as singular, if not incredible. The Indians on the banks of the Oronoko assert that, previously to an alligator going in search of prey, it always swallows a large stone, that it may acquire additional weight to aid it in diving and dragging its victims under water. The author being somewhat incredulous upon this point (how could he be otherwise?), Bolivar, to convince him, shot several with his rifle, and in all of them were found stones, varying in weight according to the size of the animal. The largest killed was about 17 ft. in length, and had within him a stone weighing about 60 or 70 lbs. The author, however, still remains sceptical (very properly, we think), and has some doubts whether these stones are not calculi secreted in the stomach!!! (See *Recollections of Venezuela and Colombia, by an Officer of the Colombian Navy.*)

Charming of Serpents.—Stedman, in his *Expedition to Surinam,* describes certain sibyls among the negroes, who, together with other singular practices, can charm or conjure down from trees certain species of serpents, which will wreathe about the arms, neck, and breast of the pretended sorceress, listening to her voice; and nothing, as he adds, is more notorious, than that the eastern Indians will rid their houses of the most venomous snakes, by charming them with the sound of a flute, which calls them out of their holes. Instances of the same kind, however incredible they may appear, are given, not only by ancient writers, such as Pliny and Seneca, but by modern authors of undoubted credit, such as Sir William Jones, Bruce, Shaw, Greaves, Chardin, Forbes, and Chateaubriand.

Eyes of Crabs and Lobsters. — Dr. W. E. Leach has invented a term (Podophthálma) to distinguish crustaceous animals, from the mechanism of their eyes, which are placed at the extremity of pedicles, somewhat like the glass of a telescope. M. Lamarck says that these eyes are not retractile, like the horns of the snail, but he has observed, in living crabs and lobsters, that the eyes, at the least touch, are drawn back a little into the sheath, and concealed in the same *fossette* where they are placed. (*Lamarck, Discours d'Ouverture*, p. 15.)

The Tyrian Purple Dye. — The colour extracted by the ancients from certain shellfish, and so highly esteemed, as to be reserved exclusively for princes, has been produced by modern experiment, though its value, it should seem, has passed away with the fashions of antiquity. More than one sort of shellfish furnishes a purple dye, but the principal belong to the two genera *M*ùrex and *B*úccinum, which can still be procured in great plenty on the shores of the Mediterranean. The great expense of the process would preclude it, we imagine, from answering the purpose of modern speculation, for one shell only affords a single drop of the dye; and it required (at least in the ancient process) six pounds of dye to one pound of wool, which, when dyed, sold at the enormous price of a thousand Roman denarii, or about 36*l.*

Hatching of Female Eggs. — It has long been remarked, by collectors, that the male broods of insects always appear earlier than the female broods; but we do not know whether it has also been remarked, that the eggs from which females are produced are longer in hatching. I can state one instance in which this was distinctly the case. Upon the leaf of a poplar tree I found three eggs of the Puss moth (Cerùra vínula), two of which were hatched about two weeks before the other. The first were males, the last a female. As they were on the same leaf, and presumed, of course, to be laid by the same parent, at the same time, the difference of hatching could not arise from difference of weather, exposure, &c. — *J. Rennie.*

Doubtful Discoveries. — It may serve, in some measure, to confirm M. Dutrochet's recent opinion of the non-existence of miscroscopic animalcula, that the celebrated Spallanzani persuaded himself that he could see Animálcula infusòria which could be seen by nobody else. He attributed his own superiority of vision, in this respect, to long practice in using the microscope. The philosopher exulted in his enviable distinction, when a peasant, to whom he showed his animalcula, could perceive nothing but muddy water.

Mistakes of Instinct. — In the account of that most singular parasitic flower (having neither leaves nor stem, it can scarcely be called a plant), the Rafflès*ia* Arnóld*ii* (*Mag. of Nat. Hist.*, p. 68.), it is mentioned that it smells like tainted beef; and, on its first discovery by Dr. Arnold, a swarm of flies were gathered round it, for the purpose, he imagined, of depositing their eggs upon it, supposing it, no doubt, to be in reality tainted beef. This is one instance in hundreds which might be enumerated, of what may be called the *mistakes of instinct*, where it depends upon the information of the senses; and, in this respect, similar mistakes frequently occur, where the higher powers of human rationality are deceived by analogous phenomena. The fine nutty flavour of cherry laurel-water and of prussic acid, both most deadly poisons, would be certain to deceive the inexperienced; and Majendie's maid-servant actually fell an immediate victim to her desire of tasting the prussic acid which she found in his laboratory. It is needless, however, to waste words in illustrating human mistakes of this kind, as it is an article of popular belief, and supposed to arise from the artificial habits acquired in social life; whereas, the same popular creed would have us believe that wild animals never mistake poison for food, and that their instinct is infallible.

How universally soever this doctrine may be believed, there can be no doubt that it is founded in error; for, as I have said, numerous instances could be given of the mistakes of instinct. I shall content myself with mentioning one or two.

The common earthworm (*L*umbrìcus terréstris) is instinctively afraid of moles; and, no sooner does it hear any subterranean noise, or feel any *tremblement de terre*, similar to those indicative of the approaching movements of its enemy, than it makes a speedy escape to the surface. Every boy knows how to take advantage of this, to procure fish-baits, by thrusting a spade or a stake into the ground, and moving it backwards and forwards, to imitate the advance of a burrowing mole in search of prey. The worm, unable, with all its instinct, to discriminate between its subterranean enemy and the spade, darts into daylight, and is instantly captured for the boy's bait-bag. The lapwing (Trínga Vanéllus), it is said, is aware of this instinctive fear of the earthworm of subterranean concussions or noises; and, when it cannot find sufficiency of slugs, &c., above ground, it pats the ground with its feet, till the earth-worms, mistaking it for an advancing mole, come forth to be feasted upon. I cannot, on my own knowledge, vouch for the authenticity of this ingenious device in the lapwing; it is stated, however, as a fact, by Dr. Anderson, in his *Bee*.

It is well known that, whenever a hawk appears, he is immediately surrounded by a host of small birds, particularly swallows, which dart at him and tease him, for the purpose, as it is supposed, of distracting his attention, on the principle that "Wealth makes wit waver." Be this as it may, the cuckoo, which bears a strong resemblance to the hawk when on the wing, is certain of a similar retinue of small birds wherever it flies. In the north, this is so commonly observed, that the cuckoo is vulgarly believed to be always attended by a *titling* or pippet (*A*laúda mìnor, or *A*. praténsis *Linn.*), which, it is further imagined, has been its stepmother and nurse from the egg. This, indeed, is the bird whose nest the cuckoo most frequently selects to deposit the eggs which she so strangely and unnaturally abandons; though it is not on this account, but because she appears to be a hawk, that the pippet and other small birds persecute her.

An instance similar to that of the flies mistaking the Rafflès*ia* for beef occurs in our country, where the common flesh-fly (*M*úsca vomitòria) lays its eggs in the fetid sorts of Phálli and *A*gárici, apparently under the notion that these are genuine carrion.

If I may be allowed an example from domesticated animals, Linnæus records, in his *Lachesis Lapponica*, that, at Tornea, there is a meadow or bog full of water-hemlock (*C*icùta viròsa), which annually destroys from fifty to a hundred head of cattle. It seems that they eat most of it in spring, when first turned into the pasture, partly from their eagerness for fresh pasture, and partly from their long fasting and greediness, the herbage being then short. Besides, from the immersion of the hemlock under water, it may not have the proper scent to deter them. A similar destruction of cattle from the same cause, occurs in the wide meadows of Leinings. — *J. Rennie.*

The Hawfinch's Nest. — On the 14th of May last, the nest of a hawfinch (*F*ringílla *C*occothraústes *Temm.*) was taken in an orchard belonging to Mr. Waring, at Chelsfield, Kent. I have seen the nest and eggs, and also the old female bird, which was shot on the nest. As the nest differs from the descriptions of the naturalists whose works I have referred to, and as, I believe, it is only within the last few years that the hawfinch has been known to breed in this country, a particular account of the nest and eggs may be acceptable to ornithologists. The nest has been described to be of beautiful construction, and built in the upper branches of trees; whereas, the one just mentioned was of a slovenly loose form, and shallow, not being so deep as those of the greenfinch or linnet, and was placed against a large bough of an apple tree, about 10 ft. from the ground. It was composed externally of dead twigs and a few roots, next with coarse white moss or lichen, and lined with horsehair and a little fine dried grass. The eggs were five in number, about the size of a skylark's, but shorter and rounder, of a dull greenish-grey, irregularly streaked, and spotted with bluish-ash and olive-brown, some of the spots inclining to dusky or blackish-brown; the markings were variously distributed on the different eggs.— *T. F. London, June 23.*

National Distinctions. — In the *Hue and Cry* of Jan. 22., a list of 102 deserters is advertised. Of these there are,—English, 34; Irish, 32; Scotch, 16. Of the 16 Scotch, 6 have long necks; of the 52 Irish, 12 have long necks; of the 34 English, 7 have long necks. Most of the Irish are described as having short necks. These are described as having large and wide mouths: English, 3; Irish, 19; Scotch, none. Nearly all the long-necked Scotch are weavers and spinners. The chief peculiarities appearing in the list are, that the Irish have as frequently blue eyes as grey or hazel, while the blue eyes, among the English and Scotch, are to the grey, as one to six; that the Irish monopolise all the wide mouths; that there are more fair-haired men among the Scotch than among the Irish, and more among the Irish than among the English. (*Times,* January 25.)

The Spider of Solomon. (Prov. xxx. 25.) — The learned Dr. Scott of Corstorphine, in a paper read before the Wernerian Natural History Society of Edinburgh, and since published in Professor Jameson's *Journal,* has gone far to prove that the word translated spider should have been translated lizard. Lizards of all kinds are very numerous in Syria. Bruce saw in one day many thousands of them, in the great court of the Temple of the Sun at Balbec. The ground, the walls, and the stones were covered with them; and the various colours of which they consisted, made a very extraordinary appearance, glittering in the sun, in which they lay sleeping and basking. Arabia is full of lizards; and, wherever a tent is pitched or a house reared, the Arabs are infested with their presence. Solomon's spider is said to take hold with its hands, while in kings' palaces; the hind, but especially the fore, feet of the lizard very much resemble the arms and hands of a man. Hence, the tribe of animals to which this family belongs are called *Lacértæ,* i. e. creatures with arms or hands. Supposing the spider of Solomon (*Semamith* in the original Hebrew) to be a lizard, it is most consistently said to take hold with its arms or hands, in moving from one place to another, that it may catch flies, which are its ordinary food, elude the pursuit of its enemies, when it moves along places which they cannot reach, or secure its safety if its back be undermost. In these respects it was natural for him to admire its dexterity, and declare that it discovered great wisdom, though it was little on the earth. (*Scott* in *Jam. Phil. Jour.,* Dec. 1827, p. 35.)

A Canary Bird fed by a Sparrow — You may, perhaps, Mr. Editor, have read an observation of Mr. Hunt's, in his charming little periodical, *The Companion,* that the same things have been acting over and over again since the beginning of the world, with only slight alterations as to time, name, and locality; an observation which, I think, I can also illustrate myself, if you will permit me to give you the history of the benevolent Howard, acted over again, about a dozen years ago, by so very humble an individual as a house sparrow.

The late Mrs. O'Brien, of Manor Place, Chelsea, was extremely fond of birds, of which she kept a considerable number in cages, for her amusement. Among others she had a canary, who was a particular favourite but the loudness of his note often obliged her to put him outside of the window, among some trees which were trained up in front of the house. One morning during breakfast, when the cage was thus placed, a sparrow was observed to fly round and around it, to stand upon the top, and to twitter to the bird within, between whom and itself a species of reciprocal conversation at length began to ensue. After a few moments he flew away, but returned in a short time, bearing a worm * in his bill, which he dropped into the cage, and again flew away. Similar presents were received day after day, at the same time, by the canary, from his generous friend the sparrow, with whom he at length became so intimate, that he very often received the food thus brought, into his own bill, from that of the sparrow. An affair so curious and interesting had, I assure you, often many spectators; and some of the neighbours, to try the extent of the sparrow's benevolence, also hung their birds out at the window, when, curious to relate, they found them also fed; but the first and longest visit was always paid by the sparrow to his earliest acquaintance.

Though thus intimate and social with his own kind, as his historian I must not forget to observe that this sparrow was extremely shy and timid with respect to human beings; for, though many were witnesses of what I have related, they were still obliged to observe at a distance, and in silence, otherwise he instantly flew away. Whether this arose from a feeling of injury that he had received from any of our species, I cannot say; though, most probably, he had been robbed of his young by some mischievous boy, or otherwise he could not have had so much time to devote to strangers. The summer, however, passed away, and autumn's many-coloured foliage was already scattered by the breath of winter, ere the sparrow ceased to visit his captive friends. But at length it was observed that one day the benevolent bird came not, that another and another still passed away with the same omission, and, in fine, that he came not again! I wish that I could add to the interest and sublimity of my tale, by finishing it with an affecting description of the deaths of at least some of the captive birds; but truth forbids the relation, and such only, Mr. Editor, will be at any time offered to you by your correspondent, — *C.*

Introduction of Foreign Birds. — Every one who admires the music of the groves, and who resides in a country too far north to be visited by the nightingale, regrets the absence of that far-famed bird. It is believed by those who have studied the habits of our migratory songsters, that both old and young ones return to their old haunts in the breeding season. Hence it has been suggested that, if any of these annual visitants were bred beyond the ordinary limits of their accustomed place of nidification, the young, perhaps, would return to the same place in the following season.

Relying on this as a means of introducing the nightingale to the northern parts of the island, Sir John Sinclair commissioned the late Mr. Dickson, of Covent Garden, to buy for him as many nightingales' eggs, at a shilling each, as he could procure. This was done accordingly; the eggs were carefully packed in wool, and sent to Sir John by the mail.

In the mean time, the Baronet had employed men to find and take care of several nests of the robin-redbreast, in places where they might hatch in security. The eggs of the robins were exchanged for those of the nightingales, were sat upon, hatched, and brought up by their foster-parents. † The young nightingales flew at the usual time, were seen for some time afterwards, emigrated, it was supposed, at the usual period (September), but never returned to the place of their birth.

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* I question the fact of a canary eating worms at all. — *J. R.*

† Redbreasts readily forsake their own eggs, when they are touched. How did they relish the foreign ones? — *J. R.*

Mr. Anderson, of the Chelsea botanic garden, who has furnished this account, thinks that this trial was not a fair one, because their translocation should be gradual, progressing farther and farther north, in succeeding years; and, were such a method practicable, he thinks it might succeed in course of time, being persuaded, from what he has noticed of this bird, that they choose their breeding-place as much from convenience, as from any constitutional delicacy compelling them to fear either the want of warmth or want of food. Mr. Anderson adds that he has had nightingales' eggs hatched by redbreasts, in the Chelsea garden; and thinks that some of the young returned the following year, but were soon caught by the vagrant birdcatchers in the neighbouring gardens. The unfledged nightingales, he observes, are also, more than other birds near towns, liable to be destroyed by cats, from their noisy clamour for food, as soon as it is light in the morning, and thus calling the cat to their nest. No bird is so easily caught by a trap as the nightingale; and great numbers of them are so taken every year in the neighbourhood of London, a practice much condemned by the inhabitants of the surrounding villas.

To this account we have only to add, that we think Mr. Sweet's manner of keeping and breeding tame birds, would sooner furnish a supply of wild ones than any other mode.

Negroes. — Blumenbach gives a most entertaining account of a little library which he possesses of works written by negroes, from which it appears, that there is not a single department of taste or science, in which some negro has not distinguished himself. (*Scotsman*, Dec. 29.)

Faculties of Brutes. — The dog is the only animal that dreams; and he and the elephant the only animals that understand looks; the elephant is the only animal that, besides man, feels *ennui;* the dog, the only quadruped that has been brought to speak. Leibnitz bears witness to a hound in Saxony, that could speak distinctly thirty words. (*Medical Gazette.*)

Men and Plants are equally under the Influence of Climate. — Where the spruce and Scotch pines and where bushes will not succeed, the nature of man seems equally defective. He sinks in the struggle with necessity and the climate. —(*Von Buch's Lapland.*)

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The Marmot (*Mus Marmota* Lin.). (*fig.* 170.) — These beasts, in the strictest sense, make hay; they bite off the grass, turn it, and dry it in the sun. It is reported that they use an old she marmot as a cart. She lies on her back, the hay is heaped on her belly, and two others drag her home. (*London Medical Gazette.*) The Alpine marmot, or mountain-mouse, inhabits the highest summits of the Alps and Pyrenean mountains, in dry places without trees. It is social, living in societies of from five to fourteen, who, when basking in the sun, place a sentinel in advance, who whistles on the approach of danger, when the marmots retire into their holes. These holes are lined with moss and dry grass. About the end of September they retire into them, and stop up the entrance with earth, and there they remain in a torpid state till March. They are generally taken by digging out during winter. Their flesh is tender and delicate, their skins valuable, and the Savoyards esteem their fat medicinal. They live on insects, roots, and vegetables, and are fond of milk. The Savoyards expose them as shows in various parts of Europe. Even in a warm climate, they are said to fall into a state of torpidity in winter.

Curious Duck. — Sir, Your Prospectus encourages me to send you a trifle, which you may perhaps find room for in your "collection of facts."

In the neighbourhood of this place is a domestic duck, which flies with the same power and at the same height as a crow; or rather, I should say, in the same way as if it was wild. I saw him crossing the road yesterday, and for some time was lost in wonder at what strange bird it could be. The people of the village, however, soon answered my enquiry, and assured me this duck would often make the circuit of a mile. The weakness of flight in domesticated birds is, no doubt, occasioned by the little or no use that is made of their wings. It would be curious to ascertain what first taught this duck to know that he could fly whenever he chose. On visiting my friend Mr. S. at Tittenhanger Green, the other day, I was again surprised at seeing a flock of fifteen or twenty geese get up and fly tolerably well for near four hundred yards, pass a hedge, and alight on the borders of a pond. Your obedient servant, — *H. S.* *Northaw, Herts, April* 4. 1828.

Art. III. *Botany.*

Experiments on Vegetation. — The celebrated chemist, Professor Dobereiner of Jena, has made the following experiments on the vegetation of seeds. Two glass vessels were procured, each of the capacity of 320 cubic inches, and two portions of barley were sown in parts of the same earth, and moistened in the same degree; they were placed one in each vessel. The air was now exhausted in one, till reduced to the pressure of 14 in. of mercury; and condensed in the other, till the pressure equalled 56 in. Germination took place in both nearly at the same time, and the leafits appeared of the same green tint; but, at the end of 15 days, the following differences existed: — The shoots in the rarefied air were 6 in. in length, and from 9 in. to 10 in. in the condensed air. The former were expanded, and soft; the latter rolled round the stem, and solid. The former were wet on their surface, and especially towards the extremities; the latter were nearly dry. "I am disposed," says M. Dobereiner, "to believe that the diminution in the size of plants, as they rise into higher regions on mountains, depends more on the diminution of pressure than of heat. The phenomena of drops of water on the leaves, in the rarefied air, calls to my mind the relation of a young Englishman, who, whilst passing through Spanish America as a prisoner, remarked that, on the highest mountains of the country, the trees continually transpired a quantity of water, even in the driest weather, the water falling sometimes like rain." (*Bibliotheque Universelle.*)

O'rchis pyramidàlis. — On Sunday, the 29th of June, 1828, was brought to me a specimen of the O'rchis pyramidàlis, in which the flowers were destitute of spur and lip. Each flower consisted of a calyx of three-coloured leaves, and a corolla of three petals, all quite uniform, and the organs of fructification (which were of the form proper to the genus) were placed in the centre — *D. Stock. Bungay, July* 28.

The Ivy-leaved Snapdragon, or Toadflax (Antirrhìnum cymbalària), is supposed by botanists not to be a native of this island. I found a considerable patch of it, in the end of May, on the lower part of a rock near Barmouth, North Wales. It was some distance from any house, and in a situation where it was not likely to have escaped from a garden. — *T. F.* *June* 23.

Eròdium cicutàrium var. 3. is, I believe, the only English Eròdium with any sort of figure on the petals. This has two, or more commonly three, of the petals stamped near the base with a spot of green, which is a considerable addition to its beauty. This summer I found an Eròdium with these spotted petals, and answering to the characters of this species in every respect but the simple stamens. The filaments had a tooth near the base, on each side; in that respect, and in the pale colour of the leaves, it corresponded with the E. marítimum: one of the stipulas was considerably broader than the other, and cleft about half way down; a character of no great importance, but, such as it was, differing from both species. I mention the circumstance, because Sir J. E. Smith says expressly that the petals of E. marítimum are not spotted, and makes the following observation with regard to the stamens: —" Mr. Sowerby observed the abortive *filaments* to be peculiarly broad, and the perfect ones to have a tooth at each side, near the base." This last mark would greatly strengthen the specific character if it should prove constant, which, in these organs, so various, if not mutable, in this natural order, cannot absolutely be relied on, unless confirmed by experience. — *E. K.*

Antirrhìnum Linària.—Sir J. E. Smith says of the common yellow toadflax (*A*ntirrhìnum Linària), that flowers regularly five-cleft, with five spurs and five equal stamens (like the Swedish variety that was so near being exalted by Linnæus into a new genus), have been found on the same plant with flowers naturally formed. Such a plant is represented in English botany. He observes that the same alteration has been seen in other species, as *A.* rèpens, *A.* spùrium, &c. Of this last, the flowers have been found with two, three, four, and five spurs, though not on the same plant. The whole genus having this tendency to disguise itself, it may not be thought very remarkable that the *A.* Linària should be found with two spurs; but some of your readers may be curious to see, or to possess a specimen of it, in this state. Near the end of June, I gathered a plant of this kind (of which *all* the flowers were formed in the same manner) from the hedge on the left-hand side of the road, on the ascent of the hill approaching Highgate, from the Spaniards, Hampstead. I left more there; and, though it is now too late to seek it this year, it may probably be found there, in the same condition, next summer. — *Id.*

Scílla nùtans, with the bracteas as long as the leaves, and coloured like the flowers. — I have in my possession a dried specimen of this description; but, as I remember to have seen the same thing twice, it may not be an uncommon variety. — *Id.*

Diffusion of Seeds in the Violet. — The various mechanical contrivances by which nature has enabled plants to diffuse their seeds, are matters of common observation; but I have not met with any description, in works of botany, of the mechanism remarkable in the various species of violets. The seeds of this natural order of plants are contained in a capsule of a single loculament, consisting, however, of three valves. To the inner part of each of these valves the seeds are attached, and remain so for some time after the valves, in the process of ripening, have separated and stood open. The influence of the sun's heat, however, causes the sides of each valve to shrink and collapse, and in this state the edges press firmly upon the seed, which, from being before apparently irregular in its arrangement, comes into a straight line. The seeds, it may be remarked, are not only extremely smooth, polished, and shining, but regularly egg-shaped; so that, when pressed upon by the collapsing edge of the valve, it slides gradually down the sloping part of the seed, and throws it with a jerk to a considerable distance. There is another part of the contrivance of nature, for the same purpose, in the *V*iolàceæ, worthy of remark. Before the seed is ripe, the capsule hangs in a drooping position, with the persisting calyx spread over it like an umbrella, to guard it from the rain and dews, which would retard the process of ripening; but no sooner is the ripening completed, than the capsule becomes upright with the calyx for a support. This upright position appears to be intended by nature to give more effect to the valvular mechanism for scattering the seeds, as it thus gains a higher elevation (in some cases more than an inch) from which to project them; and this will give it, according to the laws of projectiles, a very considerable increase of horizontal extent.

Some ripe capsules of a fine variety of *Viola trícolor*, which I placed in a shallow pasteboard box, in a drawer, were found to have projected their seeds to the distance of nearly two feet. From the elevation of a capsule, therefore, at the top of a tall plant, I should think these seeds might be projected twice or thrice that distance. — *J. Rennie.*

Organisation and Reproduction of the Truffle. — The truffle (Tùber cibàrium) is a vegetable entirely destitute of leafy appendages and of roots; it is nothing more than a rounded subterraneous mass, absorbing nourishment upon every point of its surface, the reproduction of which is dependent upon bodies generated within its substance. The truffle is composed of globular vesicles, destined for the reproduction of the vegetable, and short and barren filaments, called, by M. Turpin, *tigellules*. The whole forms a substance at first white, but which becomes brown by age, with the exception of particular white veins. This change of colour is dependent upon the presence of the reproductive bodies, or *trufinelles*. Each globular vesicle is fitted to give birth, in its internal surface, to a multitude of these reproductive bodies; but there are only a few of them which perfect the young vegetable. These dilate considerably, and produce internally other smaller vesicles, of which two, three, or four, increase in size, become brown, are beset with small points on their exterior surface, and fill the interior of the larger vesicles. The small masses thus formed are the trufinelles, and become truffles after the death of their parent. Thus, the brown parts of the truffle are those which contain the trufinelles; and the interposed white veins are the parts which are destitute of trufinelles. The parent truffle, having accomplished its growth, and the formation of the reproductive bodies within, gradually dissolves, and supplies that aliment to the young vegetable which is proper for them. The cavity originally occupied by it in the earth is then left occupied by a multitude of young truffles, of which the stronger starve or destroy the others; whilst they frequently adhere together, and, enlarging in size, reproduce the phenomena already described. One circumstance in the natural history of the truffle is still unexplained. If the method described be the only mode in which the truffle is reproduced, then it is difficult to comprehend the enormous multiplication of that vegetable in certain parts of France, where immense quantities are annually collected, without exhausting or even diminishing the race. If this fungus has no means of progression, how can the young truffles leave the place of their birth, and become disseminated over the soil? (*Revue Encyc.* xxxv. 794.)

Ranúnculus bulbòsus. — I was surprised, on taking up some plants of *Ranúnculus bulbòsus*, to find the bulbs all double: they were confined to a particular spot: some, which I took up on a bank immediately opposite, were of the usual form. To give you a better idea of what I mean, I have sent you a sketch (*fig.* 171.) of two of the roots. Perhaps some of your correspondents may favour me with an opinion as to the cause. I have not given my own, because I am not quite satisfied about it. — *D. S. Bungay, April.* [May not these bulbs be the usual mode of reproduction in the *R.* bulbòsus, similarly to the bulbs of crocus? — *J. R.*]

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Seed of Convólvulus arvénsis and C. sèpium. — Sir J. E. Smith, in his *English Flora*, speaking of the Convólvulus arvénsis, says, "I have never seen the capsule of seeds;" and, under *C.* sèpium, he says, "I have not seen the fruit." With respect to the existence of the fruit of the former plant, I cannot now speak positively; but, with regard to the latter (*C.* sèpium), the perfect seed-vessels are still hanging on the old stems in various places in this neighbourhood in abundance; nor do I ever remember a year in which they were not to be found; I have some now before me, collected in 1818. — *Daniel Stock. Bungay, Suffolk, March*, 1828. [The *C.* sèpium does not seed freely, but there are few plants of it which do not produce one or more persistent capsules. Last summer I raised some from seed hanging dry on the plants the previous winter. — *J. R.*]

Cause of the Smell of new-made Hay.—I have always taken it for granted that the peculiar and beautiful scent of new-made hay was caused by the Anthoxánthum odoràtum. (*fig.* 172. *a*) A short time since I met with the following extract from a work called *Elements of the Science of Botany*, in which this opinion is disputed. "Towards the latter end of June and the middle of July, in Herefordshire and Worcestershire, this grass is brown and dry down to the root, yet that sweet odour peculiar to hay while it is making, is as powerful to the olfactory sense as in other counties, where it is made at an earlier season, when this grass, at the time of mowing, may be supposed to be in perfection. Another reason for objecting to the scent exclusively proceeding from this grass is, that, in meadows where it does not abound, no diminution of fragrance is perceived in the harvest; it would therefore seem, under the most favourable circumstances, only to contribute its share, and not to be the sole cause of the fragrance of new-made hay. The sweet odour of this grass resides in the stem, more particularly in the joints, and not in the spike or flower."

I think the late mowing in Herefordshire and Worcestershire is not a good reason for supposing that the hay is not indebted to this grass for its sweet scent, for I know that the Anthoxánthum odoràtum will retain some of its fragrance for twelve months. Nor is the scarcity of this grass in any particular field at all conclusive, for I conceive that, comparatively speaking, a few plants would have the necessary effect.

But, if the scent of new-made hay is not confined to the Anthoxánthum odoràtum, then it becomes a question, from what other grass does it proceed? The following are the grasses which I have collected in this neighbourhood and dried, and from none of them did I ever perceive the least fragrance, except from the Anthoxánthum odoràtum, and that which was gathered last spring still continues to give out its delightful scent, though, of course, fainter than at first. The names are from Smith's *English Flora.*

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Anthoxánthum odoràtum (*a*) Phálaris *a*rundinàcea (*b*) Phlèum praténse (*c*) *A*lopecùrus praténsis (*d*) *A*lopecùrus agréstis (*e*) *A*lopecùrus geniculàtus (*f*) *A*gróstis vulgàris (*g*) *A*íra præ`cox (*h*) *A*íra cristàta (*i*)

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*A*íra caryophýllea (*k*)
*H*ólcus avenàceus (*l*)
*H*ólcus lanàtus (*m*)
Mélica uniflòra (*n*)
Glycèria aquática (*o*)
Glycèria rígida (*p*)
Glycèria flùitans (*q*)

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*P*òa triviàlis (*r*)
*P*òa praténsis (*s*)
*P*òa ánnua (*t*)
*B*rìza mèdia (*u*)
*D*áctylis glomeràta (*v*)
Cynosùrus cristàtus (*w*)
Festùca praténsis (*x*)
Festùca ovìna (*y*)
*Festùca l*oliàcea (*z*)

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*B*ròmus racemòsus (*a*)
*B*ròmus ásper (*b*)
*B*ròmus stérilis (*c*)
*B*ròmus móllis (*d*)
*A*vèna flavéscens (*e*)
*L*òlium perénne (*f*)]
*H*órdeum murìnum (*g*)
Tríticum rèpens (*h*)

This is not a complete list of the grasses growing in this neighbourhood, but the variety is sufficient for my purpose; and taking into consideration the small space in which they were found, it contains as many as a similar extent of country in any other part of the kingdom will produce. Out of the number, twenty-eight at least grow upon Bungay Common. — *D. Stock. Bungay, April.*

As the grasses enumerated by our correspondent include the greater number of the most common species, we have figured them, in order to afford our young readers an easy opportunity of acquiring their names. London students have only to purchase a truss of hay, out of which they may pick specimens of several of the species; many, also, may be gathered in Kensington Gardens, or in any of the lanes and meadows round the metropolis. — *Cond.*

Art. IV. *Mineralogy and Geology.*

Origin of Jet. — In the Cabinet of Mineralogy in Languedoc, M. Chaptal preserved several pieces of wood, whose external part is in the state of jet, while the internal part still remains in the ligneous state; so that the transition from the vegetable to the mineral state may be distinctly observed. At Montpelier have been dug up, several cart-loads of trees converted into jet, with their original forms so perfectly preserved, that the species of trees thus bitumenised can often be determined. A specimen of jet from Vachery can be distinctly recognised, as retaining the texture of the walnut tree; and the texture of the beech can be traced in the jet from Bosrup, in Scania. The most singular instances, however, are those of a wooden pail and of a wooden shovel, which M. Chaptal, whose authority is undoubted, affirms to have been converted into pure jet.

Age of Strata traced from their Organic Remains. — The relative age of strata is often demonstrable, as in the instance of veins crossing and recrossing, which must as clearly have been formed after the strata which they cross, as the trench of a drain must have been formed after the strata of soil through which it passes. On a similar principle, it has been attempted to prove that the schistose strata at Œningen have been formed within a recent period, because they not only contain distinct remains of the indigenous vegetables of the vicinity, but those of the walnut (*Júglans règia*). Now, the walnut not being an indigenous tree, the history of its introduction from Armenia into Italy, and thence into Germany, is known; and, consequently, the chronology of it will pretty nearly determine the age of the strata. — *J. R.*

Consequences of continued Disintegration of Strata. — According to Huttonian geologists (a class now diminishing no less rapidly than their rival Wernerians), the changes of the earth are interminable, both as to past and future. On Wernerian principles, we may say, I think, that the continual disintegration of rocks, and the continual travelling of their *débris* to lower levels, will at last reduce the globe to uniformity of level, such as some speculators suppose it to have been before the deluge, or, at least, before the fall of man. But Wernerians assert that some granites in Sweden have retained Runic inscriptions for 2000 years, and that basaltic columns preserve their angles well defined, in defiance of the influence of weathering; forgetting, however, that they cannot tell whether those Runic inscriptions maintain their original depth of engraving, and that basaltic columns are disintegrated by being rolled from their jointings, and, afterwards, comminuted by attrition, &c. They say, also, that disintegration goes on in a decreasing ratio, as the rock becomes sheltered by soil; forgetting that this soil is gradually washed away by rains, brooks, &c., and that the rock is by these means frequently, if not always, laid bare. They say farther, that detritus cannot be carried from places which are level; but, if the sea is lower than the land, all the land may be considered as a series of staired plains, if I may use the expression; and at every common section of a declivity and a plain, there is a tendency to efface the latter, by invading its boundaries or destroying its level. — *J. R.*

Borax and Soda are recommended, as tests for manganese, by Berzelius, in his treatise on the blowpipe; the former giving a purple, and the latter, on platina foil, a pale greenish blue glass. Soda, by itself, appears incapable of dissolving a sufficient quantity of manganese to impart to the glass a strong blue tint. Borax dissolves manganese easily, but the purple suit sometimes does not appear till after the addition of nitre, and is very obscure when the assay contains a large proportion of iron; but the addition of a small quantity of soda to the assay, fused with borax on platina wire, readily brings out the purple colour, rather more inclining to blue than when borax alone is used; and, finally, as more soda is added, it changes to a fine deep blue, that cannot be mistaken. — *M.*

Art. V. *Meteorology.*

Moisture of Climate influenced by Trees. — The cutting down of forests, particularly on high grounds, has been remarked to diminish the quantity of rain, by diminishing, it is supposed, the attraction for clouds. The fact, however it may be explained, has been ascertained on a large scale in America. In Kentucky, for example, many brooks are pointed out which now fail in summer, a thing which was unknown 20 or 30 years ago. In New Jersey, where the woods have been more extensively cleared, some streams have been altogether dried up. On the contrary, many streams in the United States have rather increased since the clearing of the woods; because, though the quantity of rain may be possibly diminished, the compact bed of forest leaves formerly retained the water on the surface, and exposed it to rapid evaporation; whereas, the tillage which has been introduced, allows the water to penetrate to some depth, and to afford a more permanent supply for springs and streams. — *J. R.*

Sea Air. — The atmosphere, in the vicinity of the sea, usually contains a portion of the muriates over which it has been wafted. It is a curious fact, but well ascertained, that the air best adapted to vegetables is pernicious to animal life, and *vice versâ*. Now, upon the sea-coast, accordingly, animals thrive, and vegetables decline. (*Harwood's Southern Coast.*)

To ascertain the Course of the Air, when there is not any perceptible Wind blowing. — Place a basin of water in a free exposure, throw a red hot cinder into it, and observe how the smoke which it produces inclines. Sailors throw a piece of live coal into the sea for the same purpose; and also wet a finger, hold it up in the air, and then by feeling which part becomes first (by evaporation) cool, they judge of the direction of the current of air. An instrument on the last principle has been invented by Dr. B. M. Forster, and described in the *London Journal of Arts and Sciences* for May. (*Mec. Mag.*, vol. ix. p. 272.)

Extraordinary Fall of Rain. — At Joyeuse, in the department of the Ardéche, during October, 1827, 36 in. in depth fell within eleven days; and on the 9th of that month, 29¼ in. fell within the space of two hours. During this excessive fall of rain, the barometer remained nearly stationary, at two or three lines below the mean altitude, notwithstanding the continuation of the most violent thunder and lightning during the whole time. (*Annales de Chimie.*)

PART IV.

MISCELLANEOUS INTELLIGENCE.

Art. I. *Natural History in Foreign Countries.*

FRANCE.

Paris, Oct. 9. — Comparing Paris and London, with respect to wealth and population, the taste for natural history is much greater among the instructed classes, and more generally diffused among tradesmen and shopkeepers, in the former city, than in the latter. Perhaps the original cause of this difference, like the original cause of most of the permanent differences in mankind, may be traced to climate. France naturally produces finer flowers than England, and admits also of a greater variety of enjoyments in the open air. To the climate, therefore, may probably be traced the love of showy and odoriferous flowers, and of singing birds; the establishment in Paris of a flower-market, far superior to any thing of the kind in England; and of the market for singing birds, which we have not in England at all. It may be said that what is sold in the flower and bird markets in Paris, is, in London, sold in shops, and in the green-houses in the King's Road: but this is not the fact; independently of the bird-market, the number of bird-shops in Paris is many times greater than in London; and though there are more rare plants and forced roses and flowers to be seen in Mr. Colville's green-house in winter, than in any one green-house or shop in Paris at that season, yet the aggregate number of forced flowers in Paris is greater, and the plants and flowers are not purchased almost exclusively by the rich, for display at parties, as in London. In short, in Paris, orange trees in boxes and showy and odoriferous flowers are, comparatively, a necessary of life. It may be sufficient to mention that sprigs of orange trees, in blossom, are introduced generally in nosegays throughout the winter, and flowers of tuberoses as generally in summer. Cut flowers and flowering plants in pots are also common in churches, especially during religious fêtes.

The menagery in the Jardin des Plantes, and the rich and extensive collections in the museum of the same establishment, it may easily be conceived, have contributed to the taste for, and knowledge of, zoology, in persons of leisure, and we have no doubt that the same effect, and to an extent greater in proportion to the wealth and intelligence of the mass of society, will be produced by the gardens of the Zoological Society of London. We should like to see the whole of the Regent's Park studded with the habitations of specimens of all the animals in the world, and dotted, grouped, and massed, with reference, at the same time, to picturesque beauty and the system of Jussieu, with all the hardy trees and shrubs that will endure the open air in our climate. Plants of the green-house and hot-house might be planted in the open ground (now occupied as a nursery), in the circular plot in the centre of the park, which might be covered with a glass roof supported on lofty columns, and the proper temperature kept up by lakes of hot water, and masses of rock heated by concealed fires. Here the botany and zoology of the tropics might be exhibited together, and specimens also introduced of tropical soils and mineralogy. The hollow cast-iron columns necessary for supporting the roof would be sufficiently numerous to serve both as conduits of water from the glass, and as chimneys for the smoke and for ventilation. Cool air for the latter purpose, and also fuel to the fires, would be supplied from vaulted roads underneath. But this is perhaps deviating too far from the subject of natural history.

It was observed to us, by an eminent naturalist here, that the French were greatly in advance of the English, in all that related to the preservation of the subjects of natural history; a fact which we think cannot be denied, on comparing by memory the preserved animals and birds in the British Museum, or even in the museum of the Zoological Society, with the national collections here. A very eminent artist in this way is M. Canivet, No. 22. Rue St. Thomas du Louvre, the joint author, with M. Boitard, the horticulturist, of the *Manuel du Naturaliste Préparateur*, a work of which we shall take an early opportunity of giving the essence.

As the taste for zoology in London will be greatly increased by the garden of the Zoological Society, so we think the taste for plants in pots, the only description of flowers allowed to be exposed for sale in the flower-market here, might be increased by an improvement of a different description. Suppose that, in imitation of what has taken place in Paris, burials were no longer permitted to be made in the churchyards of the metropolis, and that these receptacles, instead of being removed, or so far altered as to hurt the feelings of the living, were rendered depositories for flowers and ornamental plants in pots for sale. But, however much this might add to the salubrity and beauty of London, it is perhaps too great an innovation to be dwelt on at present.

With respect to the taste for natural history among the country population of France, as compared with England, the difference is almost beyond calculation in favour of the latter country. With reference to taste and knowledge of every description, Paris, in relation to the French provinces, may be compared to a garden in a desert. In Paris every thing is in abundance and in perfection; in the country the most deplorable ignorance prevails among almost all those who cannot afford to pass a considerable part of the year in Paris. No great or lasting improvement will be effected in France till this ignorance be removed by the general education of the lower classes; but, whenever this shall take place, the improvement in arts, sciences, and taste, will be great in proportion to the favourable climate of the country. Mr. Brown lately arrived here from the south of France, on his return to London. Mr. Swainson, the distinguished ornithologist, is here, busily occupied in making drawings and taking notes. Mr. Harvey, our eminent zoological draftsman, has also lately made his appearance. In our next we shall probably give some account of the Paris Natural History Society, and of the Linnean Society; but we have hitherto been chiefly occupied with horticultural matters in the country, and to-morrow (Oct. 10.) we set off for Munich and Stuttgard, to return hither in three or four weeks. — *Cond.*

Mineral Waters of Geilnau, Fachinger, and Setlers. — These waters, chiefly composed of sodaic salts, arise from a stratum of argillaceous schist near to dolomite and igneous rocks. M. Bischof, upon accurate analysis, found the following chemical elements: — Carbonate, sulphate, muriate, and phosphate of soda; carbonate of lime; carbonate of magnesia; carbonate of iron; silex; and free carbonic acid. (*Bulletin des Sciences.*)

GERMANY.

The Lesser Thrush. — M. Neumann has recorded the very extraordinary fact, of a specimen of the *Túrdus mìnor* being taken on the 22d December, 1825, in a wood near Kleinzererbst, in the duchy of Anhalt-Cœthen. It is difficult to explain the appearance of this bird, exclusively indigenous to North America, unless it be supposed to have escaped from a cage; though the bird, which was a male, was in fine feather, and exhibited no marks of confinement. (*Oken's Isis*, v. p. 520.)

Geological Indications. — The Russian minister, Struve, has collected some very interesting geological facts in the environs of Hanover. At Linden and Vetbergen the coarse chalk contains ammonites, belemnites, and impressions of fishes; at Gehrden, a chalky marl, lying over sandstone, contains crabs, like those of the island of Amboina; at Bargberg, near Gehrden, oysters are found; near Linden is a spring of petroleum; near Badenstadt, at the foot of the Lindenerberg, a salt spring was discovered in 1778; near Norten there is a quarry of galena and sulphate of strontian; in the bailliage of Blumenau there was found a specimen of amber; and near Bemerode is a mound of excellent plastic clay. The Deister possesses mineral springs, acidulous and ferruginous.

NETHERLANDS.

Proliferous Flowers. — M. Courtois has given excellent descriptions, in the *Bydragen tot de Natuurkund Wetenschappen*, of two proliferous flowers, and communicated specimens and figures of them to M. Nees of Bonn. The one is the *E*rýsimum cheiranthöìdes, the other the *Verónica* mèdia *Schrad.*, var. phyllántha. These proliferous varieties have been perpetuated for several years in the botanic garden of Liege. A singular variety of the Lonicèr*a P*ериclýmenum is described in the same work by MM. Koning and Van Hall, in which the stamens have been transformed into a second corolla. (*Bulletin des Sciences.*)

Flòra Bélgica. — The first volume of a work under this title has just been published by two excellent botanists, MM. le Jeune and Courtois, containing 597 species, arranged according to the Linnean system, and extending inclusively to Pentándria Polygýnia.

SWITZERLAND.

Migration of Butterflies. — On the 8th or 10th of the month of June, Madame de Meuron Wolff and all her family, established during the summer in the district of Grandson, Canton de Vaud, perceived with surprise an immense flight of butterflies traversing the garden with great rapidity. All these butterflies were of the species called the Painted Lady, the Belle Dame of the French, the Papílio *c*árdui of Linnæus, and Vanéssa *c*árdui of the modern system. They were all flying closely together, in the same direction, from south to north, and were so little afraid when any one approached, that they turned not to the right or left. The flight continued for two hours without interruption, and the column was about 10 or 15 ft. broad. They did not stop to alight on flowers, but flew onwards, low and equally.

This fact is exceedingly singular, when it is considered that the caterpillars of the Vanéssa *c*árdui are not gregarious, but are solitary from the moment they are hatched. Professor Bonelli of Turin, however, observed a similar flight of the same species of butterflies in the end of the March preceding their appearance at Grandson. Their flight was also directed from south to north, and their numbers were immense. At night the flowers were literally covered with them. Towards the 29th of March their numbers diminished, but even in June a few still continued. They have been traced from Coni, Raconni, Suse, &c. A similar flight of butterflies is recorded, at the end of the last century, by M. Loche, in the *Memoirs of the Academy of Turin.* During the whole season, those butterflies, as well as their larvæ, were very abundant, and more beautiful than usual. (*Mém. de la Société de Phys. et de Hist. Nat. de Genève.*)

Rock Blocks. — M. von Buch has undertaken to show that the rock blocks, which are scattered over the vicinity of Mount Jura and elsewhere, have been dissevered at once by a violent shock, and that they have not been simply rolled upon an inclined plain, nor carried along by avalanches, nor projected by explosions of gas, as M. de Luc supposed. He finds that the higher blocks of the Jura must have required an impetus of 357 feet to traverse in water alone (dans de l'eau pure), the space between the point of Ornex and the Jura. This is an impetus five times less than that of a cannon ball; and if the water (as it must have been) were loaded with sludge, the weight of the blocks would be thence much diminished. He refers for proof of his theory to the bursting of the Lake De Bagne, which being situated 150 feet above the valley, rushed on with an impetus of 33 feet. Chains of mountains have been elevated upon the fissures made across the secondary deposits which have been rent, raised, and changed, while metals and oxygenated minerals have been introduced by gas into the formations. All the great Alpine valleys have a suite of lateral ravines, of contemporaneous origin with the mountain chains whose elevation produced the dispersion of the blocks, the waters having risen, and forming a *débâcle*, descended with the *débris* through the rents made in the secondary chains. M. von Buch answers the objection of De Luc, as to the blocks being found *behind* the mountains, and not in the ravines between them, by making Mount Sion and Salève genuine buttresses, behind which the blocks would naturally be carried. (*Bulletin des Sciences.*)

SWEDEN.

Animal Geography. — M. Gloger has published a very interesting paper, giving indications of the heights at which quadrupeds and birds of various species are found in Sweden, of which the following is an abstract: —

Quadrupeds. Cérvus Caprèolus is found up to the limits of the *P*ìnus pumílio; the *C*érvus *E'*laphus in regions somewhat lower; the *L*èpus tímidus, along with the *C*érvus *C*aprèolus; the *M*ùs decumànus and *M.* músculus, in all parts inhabited by man; the Hypudæ'us amphíbius, up to the height of 4000 feet; the *S*òrex of several species, to a height of 4300 ft.; the *M*ustèla vulgàris and *M.* Ermínea upon the most elevated mountains.

Birds. *A'*quila fúlva is found in low situations; *C*órvus *C*órnix, below 4300 ft.; Nucífraga brachyrhýnchus, in low situations; Sýlvia Títhys in higher places; S. *P*hœnicùrus, to 3900 ft.; S. *T*róchilus, 4400 ft.; S. Atricapílla, 3700; S. Rubécula, 4000; *M*otacílla álba, and *M.* sulfùrea, 4300; *C*ínclus aquáticus, 3200: Accéntor modulàris, 4600; Accéntor alpìnus, on the most elevated summits; *A*laúda arvénsis, 4400; *A.* arbòrea, 200; *F*ringílla cœ'lebs, 4000; Lóxia curviróstris, 4500; *M*otacílla troglódytes, Pàrus àter, P. cristàtus, Sýlvia *R*égulus, *C*érthia familiàris, and *S*ítta europæ'a, at 3800 ft.; *H*irúndo úrbica, and *C*ýpselus *A'*pus, on the highest summits.

RUSSIA.

Lignite. — M. Lichfeldt has discovered a mass of fossil wood upon one of the gulphs of the Danube, named Yalpoug, in the lower part of Bessarabia called Boudjak, about fifty versts from the fortress of Ismail, and opposite the town of Belgrade, upon the right bank of the gulf between the villages of Kourtchi and Impoutsit. This fossil wood may become of great importance in that part of Russia, now entirely deprived of forests. The lignite is found in the form of fissile masses, of a greyish colour, but passing in the lower portions into a deep black. In the upper parts are found quantities of the *débris* of wood, covered with bark, white, thick, and friable; the pieces pressed one upon another, and intermixed with the husks of grain (cosses de céréales). The wood, according to M. Lichfeldt, is that of the lime tree. It lies nearly horizontal between coarse sand and calcareous clay; the first in form of a wall, and the latter serving as a roof. Here many shells are found. The sand is separated from the stratum of lignite by about six inches of a resinous clay, in the lower part of which a great number of shells of different sorts are found. The clay which covers the lignite is very slaty, and where they come in contact, an infinite number of small shells occur, chiefly *D*ònax, Cárdium, and Túrbo. Over this lies an argillaceous sand, even to the roots of the green sward. It is everywhere accompanied by plastic clay.

In a geographical point of view, this stratum of lignite is very interesting. According to preceding observations made in Germany, France, England, Switzerland, and Scandinavia, and confirmed by Humboldt in his examination of the mountains of America, we ought to find lignite with plastic clay above the chalk formations. In Bessarabia, the chalk is seen cropping out near Mohilef on the Dniester, extending as far as Moldavia, in a north-east direction. The formations situated between this chain of mountains of chalk and the sea, present no analogy with the tertiary formations of France. Here, above the chalk, are found; 1. a toise and a half of coarse sand; 2. eight inches of clay stone, with a portion of lime, of which the lower part contains a little silex; 3. a calcareous cretaceous rock, 5 ft. thick, terminating at the upper part in oolite; 4. a bed of sound and compact calcareous stone, of little thickness; and 5. the whole plateau as far as the Danube and the sea, is composed of calcareous stone, horizontal, and full of shells. In the cavities of this principal formation, and generally between Bender and the sea, in the direction of north-east, is found siliceous limestone, with remains of shells, among which occur some pinnites. At a great distance from the sea, upon the banks of the Bouik, the Reoute, the Koula, and other rivers, the limestone is covered with friable marl, with crystals of selenite. From the line of the Bender to Boudjak, immediately over the sand lies a movable limestone, composed almost wholly of shells, more or less mixed with iron ochre. Large masses of oolite limestone form the distinctive character of that formation which follows the chalk, and to which geologists give the name of tertiary, although the oolite limestone often occurs under the character of the Jura limestone, as one of the principal elements of formations of the second order. (*Gornoi Journal*, No. x.)

ASIA.

Tyrian Purple Dye. — The shells from which the celebrated purple dye of the ancients was extracted, named by Pliny, the *M*ùrex and *B*úccinum, have given occasion to disputes among modern naturalists as to the species meant. M. Lesson, upon comparing the description of Pliny with the Mollúsca now found in the Mediterranean, is of opinion that the *B*úccinum is the Iánthina. It is a pelagian shell, and extremely numerous. It sustains itself on the surface of the sea by air vesicles, which Pliny calls a glutinous wax; and as soon as it is taken out of the water, there escapes from it a very pure and very brilliant violet rose colour. Each shell contains an ounce of this in the dorsal vessel. By means of alkalies, this colour is readily changed to green. The Iánthina abounds equally in the Atlantic as in the Mediterranean; and, at certain seasons, the beaches of St. Helena and Ascension are entirely covered with them. From experiments made with this colouring matter, it appears to be a valuable reactive, turning red when treated with acids, and blue with alkalies. Oxalate of ammonia gives a deep blue precipitate, and nitrate of silver a pretty ash blue for painting in water colours. (*Bulletin des Sciences.*)

Geology. — Mr. Bird has just published an interesting paper on the geology of Palestine. The Mount of Olives, near Jerusalem, is composed of soft limestone, as are also Mounts Carmel and Tabor. On the borders of the Dead Sea, the rocks are tinged strongly with the red oxide of iron; but the most singular and unexpected fact is, that here are no volcanic rocks, at least on the western shore. Mount Ferdeas, or Bethulia, four or five miles from Bethlehem, is not volcanic, as has been asserted. Most of the elevated summits of Lebanon to the east of Beyruth, are composed of rocks containing shells and vegetable remains. (*American Journal.*)

AFRICA.

Grain and Bread found in an Egyptian Tomb. — M. Passalacqua having found a quantity of grain in an Egyptian tomb, it has been carefully examined by MM. Julia Fontenelle, Le Baillif, and Kunth, who have determined it to be common wheat (*Tríticum satìvum*). M. Raspail, however, differs from those naturalists, and, by more minute examination, has satisfied himself that it is barley, which has been subjected to a considerable degree of heat; and, on torrefying some fresh barley, it assumed the same appearance with the Egyptian grain. Along with the grain was found some bread, apparently unleavened. M. Raspail supposed the tomb to be that of a high priest, and refers to Leviticus ii. 14, 15., in which it is ordered to offer "green ears of corn, dried by the fire, even corn beat out of the full ear." Some Egyptian grain in the museum of Charles X., however, is certainly wheat, with some grains of torrefied barley mixed with it. Specimens of bread, in this museum, are similar to that found by M. Passalacqua. (*Bulletin des Sciences.*)

NORTH AMERICA.

Scenery on the River Demerara. — After passing the third island, the plantations are separated by large tracts of wood; and farther on, past Amelia's Waard, an unbroken range of forest covers each bank of the river. Sometimes the ground is level; at other times, hilly, or with rocks "of an almost perpendicular height" jutting into the water. The trees display every variety of shade; the tops of some of them are crowned with bloom, of the loveliest hue, while the boughs of others bend with a profusion of seeds and fruits. "There are patches of soil up and down, and the huge stones amongst them produce a pleasing and novel effect." In a country, with the most favourable climate for vegetation, and with the richest soil, the trees grow very tall, but not of very large diameter. The trunks of but few are 6 yards in circumference. "If larger have ever existed, they have fallen a sacrifice, either to the axe or to fire [or to the rich soil and rapid climate]. Four-footed animals are comparatively scarce. The peccari in herds of 300 or 400, the red monkey, polecat, fox, jaguar, small and large ant-bear, and sloth are the principal. The birds and snakes are most numerous, and unrivalled in beauty, the birds of Cayenne excepted. There are many sorts of fish, and myriads of insects, beautiful past description in their variety of tints, astonishing in their form and size, and many of them noxious in their qualities. He whose eye can distinguish the various beauties of uncultivated nature, and whose ear is not shut to the wild sounds in the woods, will be delighted in passing up the river Demerara. Every now and then, the maam, or tinamou, sends forth one long and plaintive whistle from the depths of the forest, and then stops; whilst the yelping of the toucan, and the shrill voice of the bird called pi-pi-yo, are heard during the interval. The campanero never fails to attract the attention of the passenger; at a distance of nearly three miles, you may hear this snow-white bird tolling every four or five minutes, like the distant convent-bell. From six to nine in the morning, the forests resound with the mingled cries and strains of the feathered race; after this, they gradually die away. From eleven to three, all nature is hushed, as in a midnight silence, and scarce a note is heard, save that of the campanero and the pi-pi-yo; it is then that, oppressed by the solar heat, the birds retire to the thickest shade, and wait for the refreshing cool of evening. At sundown, the vampires, bats, and goatsuckers, dart from their lonely retreat, and skim along the trees on the river's bank. The different kinds of frogs almost stun the ear with their hoarse and hollow-sounding croaking, while the owls and goatsuckers lament and mourn all night long. About two hours before daybreak, you will hear the red monkey mourning, as though in deep distress; the houtou, a solitary bird, and only found in the thickest recesses of the forest, distinctly articulates houtou, houtou, in a low and plaintive tone, an hour before sunrise; the maam whistles about the same hour; the hannaquoi, pataca, and maroudi announce his near approach to the eastern horizon, and the parrots and paroquets confirm his arrival there. The crickets chirp from sunset to sunrise, and often during the day, when the weather is cloudy. The bêterouge is exceedingly numerous in these extensive wilds; and not only man, but beasts and birds, are tormented by it. Musquittoes are very rare after you pass the third island in the Demerara, and sand-flies but seldom appear." (*Waterton.*)

SOUTH AMERICA.

Lizards. — The colonists are particularly fond of the flesh of a very large sort of lizard, which is every where common in the shrubberies near the sea, where it lives upon crabs, and other animals cast up by the tide. The Monitor (*Lacérta Teguìkin* Linn.) is tolerably well figured in Seba (t. ii. pl. 105., fig. 1.), but erroneously, by him, made a native of Java. It is the object of an active chase on the part of the Brazilians, who employ, to take it, lines of brass wire, and hooks baited with a piece of meat. The voracity of this lizard is so great, that such an apparatus serves to take a great number, every day, in spite of their shyness and agility. (*Ann. des Sciences Nat.*)

Pearls. — The discovery of pearls in the province of Goyaz in Brazil, is due to the president, M. Lopez Gama, who caused researches to be made among the shells which abound in the salt-water lakes. He has found four perfect pearls, one large and three smaller. They are all finely rounded and polished. It is not said in what species of shells the pearls have been found. (*Diario Fluminense*, October.)

Delta of the Oroonoko and the Maragnon. — The whole coast of Guiana abounds in banks of mud, which are daily increasing, and causing the land to encroach upon the sea. This process is greatly aided by the tangled roots of the Rhizóphora *Mángle*, which extend to the very edge of the waves, and even under the water. The rivers supply only a portion of the detritus, for the sea itself is muddy to the extent of 200 geographical miles by 10 in breadth, along the shore; whereas the rivers are quite limpid. That the Maragnon, however, contributes a considerable portion of alluvial matter is probable, when we consider its extended course of 1350 miles, and its immense breadth of fifty miles at its embouchure, while its depth is very great. During the rainy season, and the melting of the snows on the Andes, its inundations exhibit an immense sea of water, charged with earthy detritus and vegetable remains. The current is then so strong, that it is perceptible at 60 miles from the coast, and this, being opposed by the usual current of the Atlantic, from east to west, gives origin to vast banks of sand towards the shores of Brazil, on the north-west of Guiana. One of the circumstances which contribute so powerfully to this effect, is the *pororoca*, or high flux, which occurs at the mouth of the Maragnon three days before every new and every full moon. It arrives in two hours at the beach, in mountainous waves of 12 to 15 ft. high. The sea is then driven more violently towards the north-west; and, along the coast of Guiana, forms very strong currents towards Essequibo and the Gulf of Paria, becoming still stronger as they approach the Amazon river. The pororoca destroys the shores entirely between Fort Macapa and Cape North; and, if there were no rocks, the beach would be still more dismantled, and the mouth of the Maragnon turned altogether to the north. We owe these details to M. Gutsmuths. (*Hertha*, ix. 5. p. 381.)

Art. II. *Natural History in the English Counties.*

Plants and Insects noticed in the Neighbourhood of the City of Bath. — Sir, I send you the subjoined lists of the rarer plants and insects which I have found in this neighbourhood, which, if you think worthy a place in your entertaining Magazine of Natural History, I shall continue at intervals.

Plants. Ligústrum vulgàre, *C*ircæ'*a* lutetiàna, *D*ípsacus sylvéstris, Sanguisórba officinàlis, *C*órnus sanguínea, *B*oràgo officinàlis, Campánula rotundifòlia, Trachèlium, and glomeràta; *C*ólchicum autumnàle, *V*ìola trícolor and *V*ìola trícolor var. arvénsis sim., *S*olànum Dulcamàra, *A*lísma *P*lantàgo, Epilòbium hirsùtum and parviflòrum, *D*áphne Laurèola, Adóxa moschatellìna, *C*otylèdon umbilìcus, Bùtomus umbellàtus, Silène inflàta, *O*'xalis acetosélla, *L*ýchnis dioíca, white and red; *L*ỳthrum Salicària, *R*esèda Lutèola and lùtea, *S*piræ'a Ulmària, Fragària vésca, Chelidònium màjus, *N*ùphar lùtea, *A*nemòne nemoròsa, *C*ístus Heliánthemum, *M*énth*a* hirsùta, *T*hỳmus Calamíntha, Linària Cymbalària, spùria, and vulgàris; *G*erànium lùcidum, *M*álva moschàta, *H*ypéricum perfoliàtum and quadrángulum, *T*ragopògon praténsis, *C*nìcus acaúlis, *E*upatòr*ium* *c*annábinum, *O*'rchis mòrio, maculàta, and máscula; Gymnadènia conópsea, Listèr*a* ovàta, *T*ỳpha latifòlia, *P*otèrium Sanguisórba, Hùmulus Lùpulus, Tórtula inérvis, subulàta, and muràlis, *B*rỳum argénteum, Gymnóstomum truncùlàtum, Orthótrichum anómalum.

Insects. *C*árabus volàceus, *L*ucànus parallelopípedus, Dýticus marginàlis and punctulàtus, Timárchia tenebricòsa, Staphylìnus òlens, Hygrómetra stagnòrum, Nèpa cinèrea, Panórpa commùnis, Hippárchia Tithònu*s*, Póntia *n*àpi, *r*àpæ, and chariclèa *Steph.*; *S*phínx *l*igústri, Pygæ'ra Bucéphala and A'rtia càja. I am, Sir, &c. — *C. C. Babington. 7. Hanover Street, Bath, July* 8. 1828.

List of Plants found in Warwickshire, varying with White Flowers. — Sir, Perceiving that some of your correspondents have noticed the occurrence, in various situations, of *S*cílla nùtans with *white flowers*, I am induced to hope that the following list of white-flowered varieties, which I have myself observed in a native state in this county (Warwickshire), may not prove wholly unacceptable.

Scabiòsa arvénsis and succìsa, *B*oràgo officinàlis, found at Allesley. Prímula vulgàris, at Allesley, and at Wooton near Warwick; with a red flower, at Allesley. Campánula rotundifòlia, at Allesley and at Coleshill; latifòlia, at Allesley. A very beautiful variety of this plant occurs commonly in the neighbourhood of the lakes in Cumberland and Westmoreland, with very pale flowers, tinged with deeper blue towards the calyx. In some parts of those counties this pale variety is more abundant than the dark-blue kind. Campánula pátula, by the side of the old turnpike road, at the bottom of the hill near the village of Meriden. Plants of this white variety, raised from seed gathered in the above situation, and introduced into the garden, have for some years continued to propagate themselves spontaneously. *V*ìola odoràta, at Allesley, &c.; with a red flower, at Castle Hill, Allesley, also on the mount at Warwick Castle; canìna, at Coleshill; with a very pale blue flower, near Coleshill Pool. *S*cílla nùtans, *C*ólchicum autumnàle, at Allesley, &c. *V*accínium Myrtíllus (fruit and flower white), in woods at Allesley and Corley. *E*rica vulgaris, *T*étralix, and cinèrea, at Coleshill Heath. *L*ýchnis Floscùculi, at Coleshill; dioíca, at Allesley. *R*òsa canìna, at Allesley and many other places. A'juga réptans, at Coleshill. *B*etónica officinàlis, *Prunélla* vulgàris, at Allesley. *P*ediculàris palústris, on Coleshill Heath. Digitàlis purpùrea, at Coleshill. *G*eràninm mólle, at Allesley, &c.; Robert*iánum*, at Wooton, near Warwick. *P*olýgala vulgàris, also with pink flowers, and also with very pale blue flowers, on Coleshill Heath, Corley Moor, &c. *T*rifòlium officinàle, at Coleshill, &c. *S*errátula tinctòria, in bogs near Coleshill. *C*nìcus lanceolàtus, palústris, and arvénsis, at Allesley, &c. *O'*rchis mòrio and latifòlia, at Coleshill; conópsea, in bogs near Coleshill; maculàta, flowers pure white, at Allesley, Coleshill, &c.

The following plants, varying in the colour of the flower, have also been observed: — *R*òsa spinosíssima, with flesh-coloured flowers, on the road-side at Guy's Cliff turnpike, near Warwick. *A*chillèa *M*illefòlium, with red flowers, at Allesley, &c. *M*álva sylvéstris, a very beautiful variety, with blue flowers, on a piece of arable land near Coleshill. *S*ambùcus nìgra, with white fruit, also white-flowered varieties, at Coleshill, &c. *S*olànum Dulcamàra, Fritillària meleàgris, near Oxford. Chiròn*ia C*entaurèum, near Dudley. *S*ýmphytum officinàle, with purple flowers, near Oxford.

It will almost immediately occur to any one, on perusing the above list, that the plants most apt to produce white varieties are such as usually bear blue, purple, or pink flowers. Yellow flowers are but little subject to variations in colour. The common cowslip, however, when raised from seed in a garden, is an exception, though, in a perfectly wild state, I never knew it to vary in colour. I am, Sir, &c. — *W. T. Bree. Allesley Rectory, near Coventry, July* 9. 1828.

Lysimàchia Nummulària. — In a marshy spot, by the Thames side, between Ham and Kingston, the *L*ysimàchia Nummulària may be found (but not very plentifully), with the leaves, calyx, and corolla thickly covered with *dark-red* glandular spots. — *E. K.*

Scílla nùtans, with white flowers, mentioned by several of your correspondents as extremely rare, may be found in great plenty in all the copses near Leith Hill, a beautiful spot, about six miles from Dorking, and abounding in all sorts of scarce and curious plants. Near it was the residence of the celebrated author of the *Sýlva.* If, Sir, you should think it desirable, I will send you a list of some of the most beautiful flowers which flourish in this part of the country. I remain, Sir, &c. — *William Perceval Hunter.*

We shall be glad to receive such a list, together with a notice of the best spot, near Leith Hill, for a London naturalist to take a lodging for a week or two, with a view to exploring the neighbourhood. — *Cond.*

Marine Shells. — Sir, about a mile from this place is a hill called Black Down, which, I suppose, may be about 600 ft. above the level of the sea, and sixteen miles from the nearest tide-mark. On the side of this hill are a number of excavations, some of them carried 300 yards under ground in a straight horizontal line, which, at the further end, may be 100 ft., some more or less, below the surface. These excavations are made for the purpose of bringing out the stones (which are found in detached masses amongst the sand), in order to be cut for whetstones, and which are considered the best in England. In these stones the miners frequently meet with lumps of marine shells, of various sorts, and as hard and perfect as if newly taken out of the sea. — *Robert Reid. Montrath House, near Collumpton, Devonshire, June* 9. 1828.

Cichòrium I'ntybus, Scílla nùtans, and *Campánula rotundifòlia,* with white flowers, have frequently been found by me in this neighbourhood. — *D. Stock. Bungay, July* 28. 1828.

Epipáctis latifòlia was found by a gentleman residing in this town, in a wood a few miles distant. — *Id.*

Former Habitats of extinct Animals. — Perhaps you may consider notices of the former habitats of extinct animals, or the visitations of birds, rare or remarkable, not irrelevant to your publication; and as the naturalist may be pleased with such observations, if preserved before they are lost or forgotten, I now send you a few, and hereafter may have opportunities of sending more.

The Beavers on the Severn. About a mile to the north of Worcester, a little brook enters the Severn, called Barbourne, or Beaverbourne, to the present day, from the beavers (Cástor Fìber) that formerly inhabited the brook; a little island in the Severn, near the spot, is still known as the Beaver island; and, higher up the stream of the Severn, is a flat green island, called *Bevereye*, which also gives its name to an adjoining hamlet. How late the beavers remained here is unknown; but the Severn was not navigable near Worcester in early times, from the weirs and rapids that obstructed its course. Giraldus states that beavers were very scarce in Wales in the twelfth century.

A Red-legged Crow (Córvus Gràculus) was shot at Lindridge, in this county, in November, 1826, a bird rarely wandering so far from its usual haunts. In your Magazine (p. 83.), a correspondent mentions the little woodpecker (Pìcus mìnor), and states his bird to be, perhaps, "the only authentic British specimen;" but a friend of mine has a specimen, shot some years ago in Nunnery Wood, near this city.

The Crossbill (Lóxia curviróstra) visits the fir trees at Hadley Green and Cotheridge, near Worcester, each spring and autumn, but in small numbers of twenty or thirty. They have a leader or sentinel, who, with the others, makes a continual *tutter, tutter, tutter*, among the trees. Some years ago, a number of crossbills were caught alive, and offered for sale here; some were kept in cages, but they all soon died, most probably from improper treatment. Old writers on natural history accuse them of visiting Worcestershire and Herefordshire, in great flocks, in autumn, for the sake of the seeds of the apple, which they pierced with their curved bills. They thus did great mischief in orchards, as they only eat the seeds, and therefore wasted quantities of apples. Repeated persecution, on this account, perhaps, lessened their numbers, and their depredations in the present day are unnoticed or unknown.

Puffins. About six miles to the north of Worcester is Westwood Park, in which is an old mansion of the age of Henry VIII., and a large pool. In a late conversation with an old man in the vicinity, upwards of eighty, he informed me that, formerly, puffins (A'lca árctica) annually visited the pool here, but it is now about six years since they have discontinued visiting it, as he has not seen one within that time. He also assured me that, in 1821, he saw the great northern diver (Colýmbus glaciàlis) on the pool, a singularly rare straggler so far to the south. He particularly noticed it from its size, and observed it dive several times, bringing up a fish after each submersion. He says that the other birds on the pool kept at a distance from it, being much alarmed at it. He recollects pointing out the bird to Sir John Packington, proprietor of the park, but he would not allow its being shot. The pool or lake is very retired; no boat is on it, and scarcely any person is ever suffered to approach it. — *Edwin Lees. Worcester, July* 20. 1828.

Tall Bristly Rose. — I have, this summer, found the Ròsa grácilis in some plenty, in thickets near Cruckbarrow Hill, Worcester, a more southerly station than is assigned to it in Sir J. E. Smith's *English Flora*. — *Id.*

A Nest of the Spotted Flycatcher (Muscicàpa grísola) was brought me about three weeks ago, which was built upon a wooden rake that was carelessly lying on the ground, in a cottage garden at Bransford, near this city. In this nest, so placed, the female laid five eggs, and even sat on them, indifferent to any one passing in the garden, till the nest was taken by a boy belonging to the cottage. The nest is carelessly put together, yet prettily constructed of long, green moss, intermixed with the catkins of the hazel, and fibres; the interior lined with thin straws and wool. Eggs thickly spotted with reddish brown. — *Edwin Lees. Worcester, June* 20. 1828.

Rare Birds observed in the Neighbourhood of Halifax, in Yorkshire. — Sir, if you consider the following catalogue worth inserting in your work, it is much at your service. The authors quoted are the following: — Bewick's British Birds, 2 vols. 8vo; Newcastle, 1805: Supplement to do., 8vo; Newcastle, 1821. Atkinson's Compendium of British Ornithology; Leeds, 1820. Fleming's British animals; Edinburgh, 1828.

Fálco *H*aliæ'tus, Osprey. *Bew.* 1. p. 13.; Bulbusárdus, *Flem.* p. 51. Two specimens only, of this bird, have fallen under my observation; one, found in a wood near Luddenden, in a state of exhaustion, and the other shot near Hebden Bridge. — F. æruginòsus, Moor Buzzard. *Bew.* 1. p. 20.; *Atk.* 9.; *B*ùteo æruginòsus, *Flem.* 55. — F. cyàneus, Hen Harrier. *Bew.* 1. 34. and 36.; *Atk.* 13.; *C*írcus cyàneus, *Flem.* 50. Rare. — F. Subbùteo, Hobby. *Bew.* 1. 41.; *Atk.* 16.; *Flem.* 49.

*S*tríx brachyòtos, Short-horn Owl. *Bew.* 1. 50.; *Atk.* 20.; *O*'tis brachyòtos, *Flem.* 56. Arrives early in September. — *S. p*asserìna, Little Owl. *Bew.* sup. to vol. 1. 8.; *Atk.* 23.; *Flem.* 58. I have reason to believe that this species has been met with here; it has not, however, fallen under my own observation.

*L*ànius excùbitor, Cinereous Shrike. *Bew.* 1. 60.; *Atk.* 25.; *Flem.* 62.; Very rare.

*C*oràcias gárrula, Roller. *Bew.* 1. 89.; *Atk.* 34.; *Flem.* 88. A fine specimen of this bird was shot in Tixby Park, near Huddersfield, in the winter of 1824, and is now, I believe, in the museum of a gentleman at Littleborough.

*Y*únx Torquílla, Wryneck. *Bew.* 1. 115.; *Atk.* 37.; *Flem.* 92.

*P*ìcus màjor, Greater Spotted Woodpecker. *Bew.* 1. 122.; *Atk.* 40.; *Flem.* 91. Rare. — *P.* mìnor, Lesser Spotted Woodpecker. *Bew.* 1. 127.; *Atk.* 40.; *Flem.* 92. Very rare. — *P.* villòsus, Hairy Woodpecker. *Atk.* 41.; *Flem.* 92. A pair of these birds, said to have been shot near Halifax, were sent to the late Dutchess of Portland, by Thomas Bolton, and is, I believe, the only instance on record of their having been observed in England.

*A*lcèdo I'spida, Kingfisher. *Bew.* 2. 19.; *Atk.* 42.; *Flem.* 90.

*S*ítta europæ'a, Nuthatch. *Bew.* 1. 125.; *Atk.* 43.; *Flem.* 81. Very rare.

U'pupa *E*'pops, Hoopoe. *Bew.* 1. 127.; *Atk.* 45.; *Flem.* 89. Shot at Low Moor, near Bradford, and now in the possession of a person there.

*C*érthia familiàris, Creeper. *Bew.* 1. 129.; *Atk.* 46.; *Flem.* 88.

*T*úrdus torquàtus, Ring Ouzel. *Bew.* 1. 96.; *Atk.* 51.; *Flem.* 65. Breeds on Blackstone-edge, and other uncultivated and solitary places, and in their autumnal migrations to the south, they sometimes remain a few days in the more immediate neighbourhood of the town.

*C*ínclus europæ'us, Water Ouzel. *Bew.* 2. 16.; *Atk.* 53.; *Flem.* 66. Not uncommon.

A'mpelis gárrulus, Chatterer. *Bew.* 1. 87.; *Atk.* 55.; Bombycílla gárrula, *Flem.* 64. An occasional, but very rare, visitant.

Lóxia curviróstra, Crossbill. *Bew.* 1. p. 134.; *Atk.* 56.; *Flem.* 75. This, and the last species, I have observed not more than once or twice in twenty years. — L. Coccothraústes, Hawfinch. *Bew.* 1. 137.; *Atk.* 57.; Coccothraústes vulgàris, *Flem.* 82. Very rare.

Emberìza nivàlis, Snow Bunting. *Bew.* 1. 152.; *Atk.* 59.; *Flem.* 78. In severe winters this species sometimes occurs in large flocks. — E. *S*chœnículus, Reed Bunting. *Bew.* 1. 149.; *Atk.* 64.; *Flem.* 78. Breeds on the banks of the river Calder, but is not very common.

*F*ringílla montàna, Tree Sparrow. *Bew.* 1. 162.; *Atk.* 66.; *P*yrgèta montàna, *Flem.* 83. Rather rare. — *F.* Montifringílla, Mountain Finch.

Bew. 1. 167.; *Atk.* 68.; *Flem.* 84. Frequent in severe winters, along with the Snow Bunting, and varies in colour almost as much as that species. — *F.* spìnus, Siskin. *Bew.* 1. 171.; *Atk.* 69.; *Flem.* 85. Arrives in October, but is an irregular visitant. — *F.* móntium, Mountain Linnet. *Bew.* sup. 1. 24.; *Atk.* 72.; *Flem.* 84.

Muscicàpa Atricapílla, Pied Flycatcher. *Bew.* 1. 201.; *Atk.* 72.; *Flem.* 63. Breeds here, but is rare.

*M*otacílla boárula, Grey Wagtail. *Bew.* 1. 196.; *Atk.* 81.; *Flem.* 74.

Sýlvia salicària, Sedge Warbler. *Bew.* 1. 223.; *Atk.* 86.; Currùca salicària, *Flem.* 69. — S. Locustélla, Grashopper Warbler. *Bew.* 1. sup. 32.; *Atk.* 87.; Currùca Locustélla, *Flem.* 69. — S. sylviélla, Lesser White Throat. *Atk.* 89.; Currùca sylviélla, *Flem.* 71. — S. *R*égulus, Golden-crested Wren. *Bew.* 1. 233.; *Atk.* 97.; *R*égulus cristàtus, *Flem.* 72.

Pàrus àter, Colemouse. *Bew.* 1. 250.; *Atk.* 100.; *Flem.* 80. — P. caudàtus, Long-tailed Titmouse. *Bew.* 1. 251.; *Atk.* 100.; *Flem.* 81.

*C*aprimúlgus europæ̀us, Night Jar. *Bew.* 1. 273.; *Atk.* 107.; *Flem.* 62. Breeds on the less frequented moors, but do not confine themselves to these situations, as I have frequently seen them in an evening on the borders of woods, and about hedges, at a considerable distance from the places where they breed. The stomach of the one I opened was completely crammed with the undigested remains of *M*elolóntha vulgàris, and *H*epìalus hùmuli.

*P*érdix Cotúrnix, Quail, *Bew.* 1. 320.; *Atk.* 123.; Cotúrnix vulgàris, *Flem.* 45. Very rare.

A'rdea stellàris, Bittern. *Bew.* 2. 47.; *Atk.* 134.; *Flem.* 95. A single specimen was shot in Royds Hall Woods in November 1810.

*N*umènius phæ̀opus, Whimbrel. *Bew.* 2. 57.; *Atk.* 140.; *Flem.* 101. Rare.

Trínga *Squataròla*, Grey Plover. *Bew.* 2. sup. 45.; *Atk.* 151.; *Squataròla* cinèrea, *Flem.* 111. A winter visitant. — T. striàta, Purple Sandpiper. *Atk.* 155.; *Flem.* 110. Shot on Ovenden Moor, December 1827. — T. alpìna, Dunlin. *Bew.* 2. 117.; *Atk.* 158.; *Flem.* 108. Breeds on Blackstone-edge. — T. pygmæ̀us, Pygmy Curlew. *Bew.* 2. sup. 11.; *Atk.* 158.; T. subarquàta, *Flem.* 107. Very rare.

Charàdrius pluviàlis, Golden Plover. *Bew.* 1. 340.; *Atk.* 159.; *Flem.* 113.

Rállus aquáticus, Water Rail. *Bew.* 2. 13.; *Atk.* 166.; *Flem.* 98. Rather rare.

Gallínula Créx, Land Rail. *Bew.* 1. 323.; *Atk.* 167.; Ortygomètra Créx, *Flem.* 98. — G. Porgàna, Spotted Gallinula. *Bew.* 2. 10.; *Atk.* 169.; *Flem.* 99. Rare.

Phalaròpus lobàtus, Grey Phalarope. *Bew.* 2. 140.; *Atk.* 171.; *Flem.* 100. Very rare.

Pódiceps rubricóllis, Red-necked Grebe. *Bew.* 3. 152.; *Atk.* 175.; *Flem.* 131. Shot at Ripponden in the winter of 1800.

Procellària pelágica, Stormy Petrel. *Bew.* 2. 249.; *Atk.* 197.; *Flem.* 135. After a severe storm, I have known this bird to be found dead, in a field two miles from this place; and this, as well as other species of sea fowl, have frequently been observed in the night flying about the iron furnaces at Low Moor, near Bradford, attracted by the blaze of these immense fires; in their nocturnal journeys from one part of the sea coast to another.

*M*érgus Mergánser, Goosander. *Bew.* 2. 254.; *Atk.* 198.; *Flem.* 128. In severe winters.

A'nas Clángula, Golden Eye. *Bew.* 2. 367.; *Atk.* 217.; Clángula vulgàris, *Flem.* 120. — *A.* Querquédula, Garganey. *Bew.* 2. 374.; *Atk.* 219.; *Flem.* 125. Very rare. — I am, Sir, &c. *R. Leyland. Halifax, July* 28. 1828.

Granite found north of the Humber. — I have heard it remarked, that granite is seldom or never found stratified north of the Humber. Not long since, as some workmen were sinking a well near Woodend, in this county, about eight miles from the Hambleton Hills, at the depth of 60 or 70 yards they came to a large mass of compact red granite, which, not being able to remove, they cut through. Granite has also been found in several places towards the hills. The soil in that part of the country is a rich alluvial earth, to a good depth. What makes this still more curious is, that no granite is found in that part of the country, as the Hambletons are composed principally of mountain limestone. It is, therefore, more than probable, that this stratum is connected with others of the same nature in the Hambletons; for, if it is not stratified, can you or any of your readers account for the presence of the granite in such immense masses? This question is well worth the attention of any person conversant in these matters. — *L. E. O. Richmond, Yorkshire, August* 16. 1828.

Snakes caught by Fishermen. — Sir, On Saturday last, August 2, a fisherman brought me a snake (*Cóluber Nàtrix Lin.*) which he had caught in his net, while fishing in Haslar Lake, one of the branches of Portsmouth harbour; and, on the following morning, a seaman brought me a second, alive and healthy, which had been just caught from the tide, on the opposite shore, among the boats, at the sally-port, or landing-place, at Portsmouth. Both the men were amazed at the occurrence; and the former, an aged fisherman, had never met with the like before. I am, Sir, &c. — *Henry Slight, Surgeon.* 100. *High-street, Portsmouth.*

Sýmphytum officinàle β grows in a hedge, on the left-hand side of the road continuing, or forming a part of, South-hill lane, not half a mile from Highgate church, at a blunt corner, where the road changes its direction. — *E. K.*

Museum at Norwich. — This establishment owes its origin to a few scientific and public-spirited individuals residing in Norwich and its vicinity, who, in 1824, united themselves for the purpose of promoting the study of natural history. At this time, a body of laws and regulations were drawn up, a president, vice-president, and a committee of twelve gentlemen appointed, for the transaction of business, and apartments taken in the Hay-market, under the rooms of the Literary Institution, for the reception of their future collection. The late lamented president of the Linnean Society, Sir J. E. Smith, was elected president, which office he filled till his death; on which occurrence, Dawson Turner, Esq., of Great Yarmouth, author of *Synopsis of British Fùci*, &c. &c., was appointed. The present object of this Society is confined to collecting specimens in natural history, together with coins, antiques, and miscellaneous articles which are objects of curiosity and admiration, as well to the general as the scientific observer; hoping, by this means, to excite a spirit of enquiry, and promote the pursuit of this interesting and engaging study. Should this attempt be successful, in inducing many to support the establishment by their purses and patronage, they will be enabled to pursue their plans of publishing their proceedings, establishing lectures, and adopting such means as would render the establishment more effectual in disseminating that spirit and that knowledge which it is their wish to promote.

Their museum now contains several skeletons and parts of skeletons, animals, and birds, including the hippopotamus, elephant, buffalo, crocodile, and lion; a few animals preserved; about 300 specimens of ornithology, chiefly British; a valuable cabinet of South American insects, consisting of about 4000 specimens; a cabinet of British insects, consisting of about 2000; a few specimens of conchology, and about 350 specimens of mineralogy and geology, besides 300 specimens of fossil organic remains. In botany it possesses but few specimens, chiefly from Switzerland.

To these may be added, a small collection of coins, Roman and other antiquities, various instruments of war and numerous other articles from different countries, and an Egyptian mummy and sarcophagus.

The whole are arranged, in two rooms, in glass cases and cabinets; and the curator is always ready to show those which are not openly displayed, and to give information relative to all. Attendance of the curator is from 10 to 6; and although admission is, by law, restricted to persons introduced by subscribers, yet the freest admission is, at all times, attainable. — *T. W. S. August*, 1828.

Medicàgo denticulàta, Orobánche caryophyllàcea, and O'phrys apífera. — Sir, It was not my intention to publish a notice of some plants recently discovered in our island, before the appearance of a "Catalogue of Plants growing wild in this neighbourhood," which I must now, from necessity, delay for a few months.

The plant which I particularly desire to make known, that your readers may, while the season lasts, observe upon its occurrence elsewhere, is the *Medicàgo denticulàta* of Willdenow (vol. iii. 1414.), and, probably, Ray's "Medica marina supina nostras foliis viridibus ad summos ramulos villosis." (*fig.* 177.) This species is common with many others of its tribe (*T*rifòlium suffocàtum, subterràneum, scàbrum, glomeràtum, &c.), along this coast, from the foot of the chalk escarpment at Folkestone, westwards, to New Romney and Rye. Messrs. Sowerby, of Lambeth, have specimens from Southampton. The plant is at once distinguished by the beautifully-reticulated surface of its legumes, which are of few convolutions, furnished with a double row of short, divaricated, hooked thorns; and, in a ripe state, black. The leaves are without spots; and, except at the extremity of the branches, destitute of hair. The legumes attracted my attention last autumn, long after the plant had withered. I sent some to the late lamented president of the Linnean Society, who did not, however, notice them to me.

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The second plant is *Orobánche caryophyllàcea* of Sir James E. Smith in *Linnean Transactions* (vol. iv. p. 169.). The description of this plant in the *Transactions* leaves us nothing to desire. I have only to observe that the scent of cloves is remarkably developed, if the plant is flowered in water. It occurred rather abundantly, in May, in hedges at the foot of the chalk in this neighbourhood, parasitical upon *G*àlium *M*ollùgo, *R*ùbus fruticòsus, &c.

The *O'phrys apífera* of *English Bot.* (*fig.*178. *b*) is a variety distinct from our Kentish plant (*c*). This will be obvious from the annexed sketch of both plants. I have received that of *English Botany* from Alum Bay, Isle of Wight, but have not detected it in this county.

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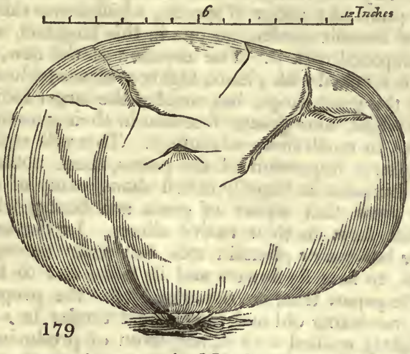
b *c*

I will merely add a brief notice of synonyms of Medicàgo and Orobánche.

Medicàgo denticulàta, *Willd.* v. iii. 1414. — Médicàgo follículo spinòso. "Cochleata minor, capsulâ nigrâ hispidâ *Volcknaer.*" Lobel, tom. 2. t. 42. n. 498. — Medicàgo coronàta? *Schkuhr. Botanisches Handbuch Planches,* v. iii. t. 2126.

Orobànche caryophyllàcea, *Sm. in Linn. Trans.*, vol. iv. 169. — *O.* màjor goryophýllum òlens, *Bauhin. Pinax*, n. 87. — *O.* caryophyllàcea, *Pallas. Herbarium, Donn.* — *O.* vulgàris, *Flor. Gall.*, n. 354. 2453. (Parisiis, 1806.) — Yours, &c. — *Gerard Edwards Smith. Sandgate, Aug.* 25.

Lycopérdon Pròteus Sowerby, the *Bovísta* gigantèa of later authors. — A large specimen of this fungus (*fig.* 179.) has been received from Mr. Robert Marnock, gardener to V. Dolphin, Esq., Moreton in the Marsh, Gloucestershire. It measured 4 ft. $2\frac{3}{4}$ in. round, was 1 ft. 4 in. long, 1 ft. 2 in. wide, and 11 in. high. The late Mr. Sowerby received a similar fungus, at least 6 in. longer and wider than the above, but, perhaps, not quite so high. It grew in a garden near Norwich, and may now be seen in Mr. Sowerby's museum, No. 2. Mead Place, Lambeth.



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Art. III. *Natural History in Scotland.*

Glasgow Royal Botanic Garden.—The following statement, understood to be drawn up by Dr. Hooker, was published by the directors of this establishment in January last: — It is now some time since any public notice has been taken of the actual state and condition of this interesting establishment; which, in spite of the difficulties attendant upon its limited means, and the error committed at its foundation, in not requiring from each proprietor a small annual sum for its support, has yet flourished beyond what its most sanguine friends could have expected. The funds destined for meeting its yearly expenditure arise principally from three sources; the sale of plants, annual subscriptions, and voluntary annual contributions. The failure of any one of these must materially cramp the means of carrying on this institution. The first of these sources has been found to increase in at least an equal ratio with the extent of the collection; and whatever may be the objections in the minds of some of the proprietors to such a mode of increasing the income of the garden, the produce arising from it is of vastly too much consequence to allow of the practice being discontinued. The second source of emolument, namely, the annual subscriptions, may also be expected to add still more to our funds, in proportion as the interest and beauty of the garden become more generally known. In regard to yearly contributions, these, being voluntary, fluctuate according to the views, feelings, and circumstances of the proprietors. Yet, surely, since by the fundamental laws of the institution such receipts cannot be enforced, a sense of the value of the collection, whether taken in a scientific or a pecuniary light, might induce the shareholders to do that which will so essentially tend to the maintenance and still greater increase of the worth of that collection.

At the time of the publication of our *Catalogue of Plants* in 1825 (which, by its distribution, has been the means of making known the extent of our riches in this department to almost every part of the globe), the number of species and distinct varieties was estimated at upwards of 8000. To these have lately been added little short of 5000 more; and these, too, as might be supposed, are, in general, vegetable productions of the greatest novelty and rarity, so that it may again be repeated with confidence, that, in point of number of species, which forms the distinguishing character of a real botanic garden, no one in this kingdom, or perhaps in Europe, can be compared with it. The erection of the new, and, from the way in which it is stocked with plants, highly ornamental house, at the western extremity of the great range, has enabled the larger individuals to be so arranged, as to afford them greater freedom in their growth, and to allow of their being seen to much more advantage. This will especially be observed upon the slightest inspection of the palms, those nobles of the vegetable kingdom, as Linnæus so happily called them, many of which are already beginning to wear that aspect of grace and beauty which eminently characterises their form in their native climes. In the same house (the great stove), the banana or plantain tree may again be expected, as it did four years ago, to bear its flowers and its fruit, and to bring the latter to perfection. The papaw tree, so remarkable for the property which its juices possess of rendering old and tough meat tender in a short space of time, if but slightly washed with it, nay, even of producing the same effect upon the flesh of old animals that feed on it, whether hogs or poultry; this tree, having room to flourish, now has several fine fruits upon it, which are rapidly advancing to maturity. Though not belonging to the palm tribe, yet, like them, the papaw tree rises with a tall and slender stem, bearing a tuft of leaves at the top, and the fruit and flowers immediately beneath. Similar in general growth to these are the tree ferns, yet of such rarity, that we know of no collection in Europe where there is a single living individual; but, during the course of the last year, we had the good fortune to receive no less than three healthy young plants, through the liberality of His Excellency General Walker, from St. Helena; whilst a fourth, of the same kind, but a different species from those now mentioned, has been brought to us by Captain Farmer, from Mr. Fraser, of New Holland. We have valuable correspondents at Trinidad, who may be said to replace the loss we sustained in the death of the Baron de Schack. His Excellency Sir Ralph Woodford, and the able botanic gardener there, have communicated many plants, but none more valuable than tne nutmeg, the first that ever came alive to this country, the Jack tree, and the mangosteen. For their security during the voyage we are indebted to Messrs. Eccles, of this city, who have shown a most liberal and unvarying attention to the interests of the institution. The famous arracacha of South America, in which country its prolific roots hold the place of the potato, and are equally nutritive, has been again sent to us, with other rarities, especially some young mangoes, by Dr. Bancroft, Dr. M'Fadyen, and Mr. R. Smith, of Jamaica. To John Pearson, Esq., of Demerara, we are indebted for some curious plants of the Indian kale; to Thomas M'Gill, Esq., of Glasgow, and his brother, Captain M'Gill, for many East Indian productions; to the late lamented General Turner, for several vegetables of Sierra Leone; to Mr. Elliot, of South Carolina, for a numerous collection of plants from that rich country. Our noble cactuses, or Turk's-cap torch thistle, the envy of every garden in Europe, are all the valued present of Captain M'Arthur, of the Everthorpe; the curious *Tàmus elephántipes*, or Elephant's foot, of R. Finlay, Esq., from the Cape. Amongst the fir tribe we possess the famous Norfolk Island pine, procured by Mr. Fraser, government botanist at New Holland, and brought to us, with many other plants from that country, by Sir Thomas Brisbane; the Chilian pine, from Mr. Cruickshanks; and the Brazilian pine. These, in their native soil, are reckoned amongst the tallest and most remarkable trees in the world. The bread-fruit may here be seen, whose history is connected with one of the most interesting and affecting narratives that have ever been recorded, in the mutiny of the crew of the Bounty, and in the preservation of Admiral Bligh, and the subsequent settlement of the mutineers on Pitcairn's Island, where the principal of them, with his family, by sober, industrious, and religious habits, seems destined, by one of the mysterious ways of Providence, to carry civilisation into the islands of the South Seas. This individual bread-fruit was sent to us by Dr. Fraser, of Berbice, but in so sickly a state that we dare not hope it will recover; yet we do not despair of again receiving and cultivating it successfully. Numerous are the vegetables indeed in our garden, which, a few years ago, it was not considered possible to keep alive any where but in their native country, and which are now flourishing in our stoves. The nutmeg, and especially the extensive tribe of air plants, as they are called, no less remarkable for their place of growth (the trunks of trees) than for the splendour of their flowers, are striking examples of this. The mahogany was long known to us solely by the beauty and utility of its wood, yet now we have good plants of it in a living state; and, by the kindness of an enlightened merchant of this city, the writer of this *Report* is enabled to publish, together with a figure, a history, commercial as well as botanical, of this most valuable of all trees. It is the staple article of trade of Honduras; and there, at the season of cutting the timber, the woods, at other times a desert, are alive with the labourers engaged in that singular duty. The double or Maldivian cocoa-nut tree was, till within these few years, only known to the wild inhabitants of the Seychelles Islands; now, the fruit has reached our shores in a vegetable state; and one individual, at the present time in England, is destined for our garden. Of other palms we possess nearly forty species. The plants of Arctic America, of the Rocky Mountains, that vast alpine range, forming a continuation of the chain of the Andes, which has just been explored during two entire years by one of Dr. Richardson's collectors (Mr. Drummond of Forfar), were, till lately, only known to the Canadian hunters, or the Esquimaux, or the still more savage Indians of North-west America. These may very shortly be seen in cultivation in our gardens, of which they will form a highly interesting and distinguishing feature. From Captain Franklin alone, who commanded the overland arctic expedition, we have received a parcel of 300 seeds. Among the useful plants of our collection we may reckon the green and black tea, the coffee, the chocolate, gum arabic, jujube tree, tamarind, logwood, ginger, arrow root, turmeric; pepper, no less than thirty-three kinds, though none of them more valuable than the black pepper of the shops; the sago, date, cocoa nut, Otaheitan gooseberry, camphor, sugar cane, bamboo, &c., not to mention many others; a new and excellent species of guava [*query* — the species, and a hint for its culture, for *Gard. Mag.*], whose fruit, which ripened last year, was pronounced by all that tasted it to be delicious, and fitted to rank with the most choice of our desserts. Among the more curious and ornamental plants, we must not omit to notice our numerous banksias and dryandras, for which we are mainly indebted to Mr. Mackay, of Clapton; the various new calceolarias, or slipperworts, and fuchsias, the gift of our inestimable South American correspondents, Dr. Gillies and Mr. Cruickshanks; the papyrus, now arrived at a height of from 12 to 14 ft.; the India rubber tree, which, could we have afforded it space enough, would ere now have attained the height of 40 ft; the side-saddle flower, the famous pitcher plant, the fly-trap or dionæa, the star apple; the cherimoja, a present from Her Grace the Duchess of Montrose; the manchineel, the alligator pear; the buonapartea, so named in honour of our late formidable enemy, and of which the sharp pungent foliage seems to be characteristic of that hero; and, lastly, we may mention what will soon be in great perfection, for they are among the earliest-flowering plants in the great green-house, the numerous varieties of that universal favourite, the camellia. Room would be wanting were we to enumerate all the persons, whether in a public or private capacity, who have rendered services to the institution, and it would but appear invidious to make a selection; suffice it to say, that the Directors have ever felt a grateful sense of their kindness. We cannot conclude this report, already perhaps extended to too great a length, without expressing a fervent wish that it were possible to put this noble and deserving establishment upon a permanent foundation. In considering the proprietors individually, this would be the most simple of all things, for a small annual sum from each would render it perfectly independent; and, let it be observed, that such is the plan with every other institution of the kind in the kingdom. It can only be done *here* by *general consent:* whereas, now, the expense, which ought to be shared by all, falls only upon the generous and the liberal; whose names, however, will stand enrolled in the *Annals* of the Society as its disinterested friends and patrons.

Art. IV. *Calendar of Nature for London.*

August. — *Flora.* The spring-like weather which has continued throughout the summer months, keeps many plants in flower which are usually over at this time. The only garden flower which particularly marks the season is the autumnal crocus (*C*ólchicum officinàlis), which flowered on the 29th. Harvest began in a few favoured spots in the last week of July, was generally in hand by the middle of August, but much retarded by frequent rains.

Fauna. The great body of swifts (*C*ýpselus *A*'pus *Cuv.*) was observed passing to the south-westward on the 10th and 11th; the last (a single one) was seen on the 18th. Towards the end of the month, swallows and house martens congregate, and are often seen resting on the ridges or sloping roofs of buildings.

September. — *Flora.* In the beginning came forth the *C*ólchicum variegàtum, *G*entiàna purpùrea, Heliánthus atroròbens, Heliópsis læ'vis, *E*'chium grandiflòrum, *A*párgia *T*aráxaci, and several of the perennial asters.

Fauna. Except swallows and house martens, very few migratory summer birds are seen after the middle of the month. The sedge warbler (*C*urrùca salicària) was the last observed. The redbreast's winter song is already heard. The notes of a few late-breeding song-thrushes were heard on the 12th. A pair of these birds hatched their young so late as the 15th, in the court of the Royal Military Asylum, Chelsea. It is remarkable that they chose for their nestling place one of the lower boughs of an elm, immediately over the gymnastic exercise ground, and in the midst of the noise and violent action of hundreds of boys, besides the frequent rolling of drums and all other military music daily. The young flew, being protected, while in the nest, by a special order of the commandant.

Insects have not been so numerous as they are in dry summers, and many which appear early have only made their appearance lately. Garden insects are only seen about London, especially those that visit the discous flowers. Among them were noticed a few of the splendid grand admiral butterfly (Vanéssa Atalánt*a*), appearing about the 8th; and, on the same flowers, many of the genus *M*úsca and Bombýlius; also all the common species of *T*'ipula, *T*abànus, *C*ùlex, and *A*silus. The warm weather has brought forth many spiders; the Diadèma unusually numerous; the Montàna appeared on the 24th.

October. — *Flora.* The garden and field flowers of last month, in consequence of the fine weather, still continue; to which are added the *A*'ster *A*méllus, grandiflòra, and Nòva A'ngliæ; Diánthus glaucéscens, *G*naphàlium, *S*tœ̀chas, &c.

Fauna. Swallows and house martens are now about taking their departure; the last swallow was seen on the 12th, and the martens were all gone on the 18th. Fieldfares and redwings arrived about the 15th, and woodcocks about the 19th. Swans beat away their cygnets. Cabbage butterflies rather numerous, and busy depositing their eggs on broccoli, &c.

The Weather. — After a long course of changeable weather, it began to clear up about the 20th of August. From that time, with but few interruptions, it has continued fine, enabling the farmer to finish harvest work, and the hop-grower to secure his produce. From the 15th to the 26th of September, remarkably fine and warm. — *J. M.* *October* 20.

Art. V. *Indicatorial Calendar.*

Notwithstanding the two ensuing months are the waning and dreary portion of the year, there are many incidents which attract the attention of the observer of nature. Though the trees have lost, or are losing, their honours, and vegetation has generally made a pause, the rural scene is not destitute of interest.

Birds. — The migrating summer songsters are all fled; but other visitors, driven from the north by a severe winter, appear in our neighbourhood. These are the different species of the genus *S*cólopax, woodcock, snipe, &c.; and it often happens that, in inland level countries, several species of the genus Fálco are seen only in the winter months. At this season, larks are congregated, and roost closely together on the ground; where, for want of larger game, they often become a prey to the night-prowling fox; chaffinches, and other small birds, congregate and roost together in thick hedges; trout repair to their spawning places; and, if it is open weather, snails and some insects are in motion.

In the fish-markets, cod, turbot, soles, gurnard, doree, skate, whitings, herrings, &c., are in season; as also lobsters, crabs, prawns, shrimps, oysters, and other testacea, in great perfection.

The moon will be with the planets on the days and times following: viz.

November 3. at	9 A.M.	Venus.	December 4. at	1 A.M.	Venus.
8.	5 A.M.	Jupiter.	5.	3 P.M.	Mercury.
8.	8 P.M.	Mercury.	6.	1 A.M.	Jupiter.
14.	8 A.M.	Mars.	12.	11 P.M.	Mars.
26.	7 A.M.	Saturn.	23.	12 P.M.	Saturn.

October, 1828. J. M.

Art. VI. *Biography.*

Memoir of the late John Templeton, Esq., forming part of the Anniversary Address delivered on the 24th of May, 1827, to the Belfast Natural History Society, by James L. Drummond, Esq. M.D. F.L.S. &c. President of that Society. Communicated by Dr. Drummond.

We have this year, gentlemen, been able to meet on the birthday of Linnæus, and I shall employ part of your time in drawing your attention to a deceased member and sincere wellwisher of our Society, who was worthy of being placed in company with that eminent naturalist. Every one present will at once perceive that I refer to the late John Templeton, a man devoted, like Linnæus, to every branch of natural history, and whose enthusiastic attachment to it continued to the end of his life. The biography of a retired man of science, like a deceased friend, seldom presents much that is interesting to the world at large, especially when he has not come much forward as an author; but those who have known and respected him will take pleasure in such details as may make them more acquainted with him, or may recall him to their recollection; and, in particular, you, who are engaged in the same pursuit, will be gratified by even an imperfect account of his exertions, of his discoveries, and of the treasures he has left behind him. Whilst, in compliance with your wish, I have undertaken to pay this tribute of respect, I must regret that it was not undertaken by some one who had been longer and more intimately acquainted with him, and who could, therefore, have done more justice to the subject. The readiness, however, with which sources of information have been laid open to me by the family, have, I hope, enabled me to fulfil your desire better than I could have expected; and I have myself derived considerable pleasure in the employment; whilst the character, as well as the talent and information, of our departed friend, has risen greatly in my opinion, as I have become more acquainted with him.

Mr. Templeton was born in Belfast, in the year 1766. His father resided there, and at his country house in Malone, near this town, where the family have been settled since the early part of the 17th century, and where he himself constantly lived since his father's death. To this place he gave the name of Crann-more, i. e. the *Great tree*, in honour of the very fine chestnut trees which are in front of the house, and which were probably planted in the 17th century, though there is no record respecting them. It had been previously called Orange Grove. His very delicate state of health, when a boy, was probably the cause of his attention being early turned to natural history. When unable to partake of active amusements, he took great delight in a book of natural history, containing pictures of birds, fishes, &c.; which pictures he used to copy, and with which, and the descriptions, he used to compare the various birds which his friends, knowing the pleasure it gave him, procured and sent him. That habit of discrimination, which natural history is well calculated to form, was thus early acquired. His earliest education he received at the school of Mr. Manson, a name yet respected in this neighbourhood. As he grew up he became attached to fowling and fishing, but gave up the former on witnessing the sufferings of a wounded bird, and was ever afterwards remarkable for his kind attention to every part of the animal creation. In this he set an excellent example to naturalists, for he always contrived to gratify his curiosity without pain to the subject of it, and would, at any time, have lost the opportunity of acquiring knowledge, rather than be the cause of suffering to a living creature. When circumstances justified the deprivation of life, he considered how it might take place with the least pain. Benevolence to men and brutes was, indeed, a striking feature in his character; and those who, on many subjects, differed from him in opinion, could not but have approved the motive by which he was ever actuated, — a desire to promote the happiness of his fellow-creatures. From various passages in his writings I select one, in proof of my assertion. "It is often," says he, "within the power of man to exercise a portion of benevolence; and while philanthropy confines kindness to our own species, the divine attribute of benevolence extends to every living creature, and calls to us to alleviate their sufferings. While snow covers the earth, and frost binds up the waters, the feeling heart must pity the distress, and strive to give comfort and sustenance to the winged inhabitants of the air, whose lively motions interest, and whose music adds a charm to the rural scene. Many, driven from their native wilds by the inclemency of the season, seek the plains of Ireland, in hopes of finding that comfort which their own country denied them; but scarcely are they arrived, fatigued with the length of their journey, and weak from want of food, ere they experience new calamities. In vain do they seek the silent wood, or trust to generosity for protection; for no pangs are felt by the greedy epicure or thoughtless sportsman, when innocence and beauty die. It is to innocence and beauty they call for protection. Let the youthful hand scatter food, and they will give life and happiness to hundreds; let them guard their rural walks against all destroyers of the feathered tribes, and the consciousness of having done a good action will make the music of the groves awaken ideas which the virtuous alone can enjoy." In another place I find him quoting with approbation the beautiful lines of Cowper, —

> " I would not enter on my list of friends,
> (Though graced with polished manners and fine sense,
> Yet wanting sensibility,) the man
> Who needlessly sets foot upon a worm.
>
> *   *   *
>
> The sum is this: — If man's convenience, health,
> Or safety, interfere, his rights and claims
> Are paramount, and must extinguish theirs.
> Else they are all — the meanest things that are,
> As free to live, and to enjoy that life,
> As God was free to form them at the first,
> Who in his sovereign wisdom made them all."

Mr. Templeton began to cultivate flowers about the year 1786, and soon made his flower-garden an object of attention; but it was not till after his father's death, in 1790, that, on recovery from a severe illness, he began to study botany with enthusiasm as a science; having been first directed to it by a desire of extirpating weeds from his farm, to which he then applied himself. Having made himself well acquainted with the Linnean system, he, in 1793, laid out his experimental garden, if I may so call it, which is said to have been suggested by a passage in Rousseau's *Heloise*. This had been partly an orchard, partly an osier ground; and conducting through it a stream of water, raised on an artificial rock, he rendered it in every way fit for the intended purpose. Here he collected, from various parts of the world, rare and useful plants, which he endeavoured to naturalise in this climate, by placing them in a soil and situation resembling, as nearly as possible, that to which they had been accustomed. By this means there is growing, in his garden, in the open air, a wonderful and curious collection of plants from India, China, North and South America, Siberia, &c.: such as Caméll*ia* japónica, *Thèa* víridis (the tea-plant), Ailánthus præ`cox, and others, which were formerly kept in the hot-house, and then in the green-house. Most of the trees at Cranmore (all, I believe, except the chestnuts and oaks) were raised from seed or planted by himself; and so great a variety of the natives of the forest has, perhaps, never been collected in so small a place. In 1794 he paid his first visit to London, where he formed an acquaintance with Professor Martyn, of Cambridge, author of the valuable additions to Miller's *Dictionary;* Dr. Shaw, the zoologist; Mr. Dickson, of Covent Garden, the celebrated cryptogamist; and Mr. Whitley, an eminent nursery-man, from whom he afterwards purchased many plants, and with whom he corresponded. In 1795 he became acquainted with the late Mr. Arbuckle, collector of Donaghadee; and through him, with the Earl of Clanbrassil. This nobleman, much attached to the study of botany, had Mr. Templeton frequently with him at Bryansford, and near Dundalk; on which occasions he usually accompanied Mr.

Arbuckle, with whom he carried on a frequent correspondence for some years. These visits were only terminated by the death of Lord Clanbrassil, in 1798. In 1796 Mr. Templeton paid a second visit to London, where he was introduced to Sir Joseph Banks, who took great notice of him; and then, or soon after, made him an offer to go to New Holland, with a salary of 3 or 400*l.* a year, and a large grant of land; but his attachment to his aunt and sisters, with whom he lived before his marriage, as well as to his native country, made him decline it, though the prospect it held out of prosecuting his favourite study was very tempting. Mr. Brown, the distinguished author of the *Pródromus of the Plants of New Holland*, who went to New Holland afterwards, was in the number of Mr. Templeton's friends and correspondents; and expressed his sense of the services rendered by Mr. Templeton to botany, by appropriating the name Templetòn*ia* to one of his new genera. He also became acquainted with Doctor, now Sir J. E. Smith, president of the Linnean Society, the Rev. Dr. Goodenough, late Bishop of Carlisle, with Aylmer Bourke Lambert, Esq., author of a splendid and valuable work on the genus *P*ìnus, Mr. Sowerby, Mr. Curtis, and others, besides renewing his acquaintance with Dr. Shaw and Mr. Dickson; and with many of these he afterwards corresponded. Lord Clanbrassil was in London at that time, and Mr. Templeton's letters show that he enjoyed his visit much, though glad to return to his domestic occupations. Previously to this visit, he had made some communications to the Linnean Society, which were well received. One of them was on the migration of birds, and another on soils. In the year 1799 he communicated to the Royal Irish Academy, through the Bishop of Clonfert, Dr. Young, with whom he was intimate, a paper on the naturalisation of plants, a subject to which he had devoted much attention. In this he urged the necessity of experiments. "The same Almighty hand," he says, "that formed the earth, has scattered, in far distant regions, vegetables, which the necessity or luxury of man excites him to endeavour to accumulate about his home. And if we, at the present time, survey the different nations of the earth, we shall find that most of them have received great and important benefits by the introduction of foreign plants; and that there is no country, however numerous its collection of plants, but may yet receive considerable advantages by the naturalisation of others."

This paper contains many excellent practical observations which have been referred to in different works published since that time. I shall at present quote only one. "By the appearance of the roots and leaves, we may nearly determine in what kind of soil the plant is most likely to thrive. Robust roots and fleshy or rigid leaves require a dry soil, according to their thickness, stiff clay or sandy loam, as beans, peach trees, and apple trees: robust spongy roots which have a tendency to mat near the surface, with thin leaves, as the alder (*A*'lnus), willows (*S*àlix), require a somewhat stiffer soil with moisture; many of the *S*àlix genus will not grow with their accustomed vigour in a light turf or peat mould soil, for want of the necessary resistance to the root, although suitable in respect to moisture. Slender, hard, and wiry roots as those of the pine, cistus, &c., require dry, sandy, or gravelly soils, and extremely fine and hair-like roots, as those of *E*rìca, Kálm*ia*, *R*hododéndron, &c., must have a soil whose particles will not impede the shooting of their tender fibres, and with a small but regular degree of moisture, that the roots, which by their form cannot resist the slightest drought, may not be destroyed. Plants in a warm climate perspire more than in a cold one; so in a warm one they require much, and in a cold one little moisture. Therefore when transplanted from a warm to a cold climate, they should have a drier soil, and from a colder to a warmer, a moister one than in their native station."

(*To be continued.*)

Art. VII. *Queries and Answers.*

Lathræ̀a squamària. — I have doubts respecting the identity of Hudson's Lathræ̀a squamària, with that of *English Botany* and *Flora*, &c. Would any of your readers furnish you with a short description of the plant, as it may have occurred to them? Were this done, some light might, I suspect, be thrown upon the true characters of this plant. — *G. E. Smith. Sandgate, Aug.* 25. 1828.

Scientific Work on Insects. — Can you inform me of any introductory work on entomology? I want more information respecting the classification, than is to be gathered from the excellent book of Messrs. Kirby and Spence, or any other I have met with. Messrs. Kirby and Spence allege that such a work would be found dry by readers; but it appears to me as necessary to the student of entomology, as a grammar is to the student of languages. A word or two from you, in the Magazine, might set some competent person upon writing a work of this nature, if, as I suspect, none exists. — *T. L. H. August* 18. 1828.

Rise and Fall of the Barometer. — In the *Companion to the Almanack*, published under the superintendence of the Society for the Diffusion of Useful Knowledge, it is stated, in describing the barometer, that the cause of the rising and falling of the mercury in the instrument has "long puzzled philosophers; and many erroneous solutions have been given of the problem. By some, the increase of weight has been supposed to proceed from the quantity of water dissolved in the air; this is, however, refuted by the simple fact, that when the mercury stands highest, the air is most dry; and, on the contrary, rain generally occurs when the atmosphere is light." What is meant by the words "most dry;" is it meant that the air is then freest from water, or do they signify, only, that it is then most desiccating? An explanation from some of your readers will oblige — *X. Y.*

Art. VIII. *Retrospective Criticism.*

Too great Humanity to Animals.—Sir, Having, this week, received a curious sort of letter of censure for my *too great* humanity, I enclose it to you, that you may, if you please, make use of it. It is, perhaps, scarcely deserving of notice; but, as I have understood that you like some discussion upon the various subjects treated in the past Numbers of the Magazine, I thought you might like to insert it; I send it, therefore, with some remarks in answer; but, pray, do not scruple to throw both aside, if you think it better to do so.

"Madam, — Having read, in the Magazine of Natural History, a communication from you, entitled, 'Considerations on Botany, as a Study for Young People,' wherein you recommended its pursuit over the other collateral branches, inasmuch as it was not fraught with cruelty, and that, in its prosecution, you are without the fear of inflicting pain. Now, as an experimental physiologist, I should beg to give it as my opinion, that the lower class of animals are not susceptible of the sensation of pain. This seems to be dependent upon the tardiness of their circulating systems, and consequent want of nervous energy. First, I should like to state to you, that the common eft can have its tail removed without even being conscious of it. In man, and the vertebratæ, the seat of sensation is chiefly found in the brain; but how different in insects. It is a known fact, that the head of most insects can be removed, and the animal possess the power to perform all the functions, save seeing and eating, and ultimately only dies of inanition. I am not at all an advocate for deliberate cruelty, but it seems to me that, on this subject, there exists an unnecessary and false feeling amongst your enchanting sex. A lady can read the account of a cool and deliberate bloodshed of some hundreds of fellow-beings, and call the perpetrator a *hero;* and yet the man who, from a love of, and earnest wish to improve, science, kills a few insects, is only known by the undeserving epithets of a brute, monster, or cruel wretch! With every wish that you may conquer your present fastidiousness, I have the honour to be, Madam, yours — *A Follower of Æsculapius. Aug.* 8. 1828."

In reading this letter, it is very easy to perceive that the writer is one of, what he himself considers, the *higher* class of animals; and so far, perhaps, we may agree with him, whatever may be the opinion of what we term the *lower* class, on this subject. The wasp, when it stings us, may choose to believe that *we* are not susceptible of pain; it might be convenient to him to think so, if he desired to repeat the sting; and I know not that we have any better reason for arrogating *all* the pain to ourselves, than the insect would have for denying that we felt *any*. A man may have his nails or his hair cut, without experiencing any pain from the operation, but does it follow thence that he is insensible to pain? Even allowing that the head or tail of an animal may be removed, without depriving it of the powers of motion, &c., can we, therefore, affirm that it is done without pain? Or supposing the seat of sensation, in insects, not to be in the head, can we then say, that it does not exist at all? Even admitting the fact, that the head be removed without pain, is it nothing to deprive the poor insect of sight, and of the means of supporting its life? Is it nothing to leave it to die of hunger? Whatever may be our theories on such subjects, whatever the analogies, or arguments upon which we found them, it is dangerous to act upon opinions that we cannot prove; and surely it is better even to run into a little excess on the humane side of the question, than to run the *risk* of inflicting unnecessary pain.

I agree with the writer that "she who can read the account of a cool and deliberate bloodshed of some hundreds of fellow-creatures, and call the perpetrator a hero," yet calls him a brute, and a monster, who, for useful purposes, "*kills a few insects,*" is merely squeamish; and perhaps a little affected; but let us hope that women will ever preserve that "fastidiousness," if fastidiousness it be, which shrinks from inflicting pain on any living creature. If an animal must suffer death, let it be given without torture; and, above all, let us not make the sufferings of any creature, however low its rank in the creation, a source of heartless sport. I suspect this disciple of Æsculapius is far from being heartless, and that his quickness to correct me in this matter, proceeds from a tenderness of conscience, awakened to a doubt he does not fully acknowledge to himself. In return for his anxiety for my own improvement, I sincerely hope that he will listen to his feelings as well as to his wishes, and not suffer his convictions to depend upon his will. —Yours, &c. *E. Kent. Aug.* 15. 1828.

Art. IX. *Notices.*

Dinner in Commemoration of Ray. — Naturalists of every class are deeply indebted to the labours of this great philosopher, rather, perhaps, in the assistance they have afforded to Linnæus, Buffon, Daubenton, and Cuvier, than by the knowledge generally possessed of the originals; and naturalists of every class will, of course, join in celebrating the two hundredth anniversary of the birth of the most distinguished student of nature in general who has yet run his course in this country. The arrangements in progress contemplate such a union as almost certain, and the cooperation of the various Natural History Societies of London is anticipated, by the consent of the secretaries to act as stewards. We look forward, in fact, to a National Natural History Fête.

THE MAGAZINE

OF

NATURAL HISTORY.

JANUARY, 1829.

Art. I. *Remarks on the present State of Natural History in Germany.* By W. J.

From the time that Germany, now ruled by so many princes who love and favour art, was freed from the yoke of Napoleon, it has been rapidly advancing in science. The natural sciences, in particular, have been cultivated with great zeal; and we shall not be far from the truth, if we assert that it was by the very agitation of the period alluded to, when Paris had also become the capital of Germany, that the great progress which these sciences have made was accelerated. The German is a collector by nature; and in almost every city of moderate size, a collection of some sort may be found, belonging to some private inhabitant or scholar. During the sway of the French, many learned men from Germany had occasion to go to Paris, where they were inspired with a noble emulation on beholding the splendid collections that have been made in that city since the time of Buffon. Before the revolution, Linnæus, and the phlogistic school of chemistry, reigned triumphant in Germany. The antiphlogistic chemistry (the father of which, Lavoisier, fell himself a victim to revolutionary violence) was afterwards embraced in Germany with great zeal. Priestley, and a number of other discoverers, contributed to the application of the new chemical views of physiology; and thus, in Germany, the scene was completely changed in the beginning of the nineteenth century. The incomparable Werner enlarged mineralogy; and his school, spreading from Freiberg over the whole world, gave to his views an almost canonical authority: but, as the Germans prefer truth to personal considerations, this great man had the mortification of seeing Raumer, and others of his pupils in the neighbourhood of Freiberg, discovering facts and relations in direct opposition to his system. Romé de Lisle's experiments in crystallography did not meet with much encouragement in Germany, but Häuy soon after found many adherents; and Steffens, who tried to unite his views with those of Werner; Leonard, who modelled the terminology after the French; and others, attracted great attention towards the French doctrine. Mohs and Weiss introduced a new and more active life into mineralogy: the former, by pursuing, in a certain measure, the track of his teacher, Werner; and the latter, by the enlargement of crystallography, and by bringing it, through the application of numbers, into affinity with the calculating chemistry of Berzelius. Fuchs unites the views of the crystallographers with that of the chemical constitution of minerals, in order to arrive at a scientific unity in mineralogy.

In botany, the doctrines of Linnæus had for a long time been maintained in Germany, although several Germans produced various new systems; such as Heister, the predecessor of Jussieu, who had made good use of his labours; and Büttner. It was not till the middle of the last century, that the study of the natural families of plants began to be zealously pursued; at which period the Germans had, by means of correspondence, travels, &c., begun to obtain possession of larger collections of plants. Voigt translated Richard's treatise on fruits, and reduced Jussieu's method into a tabular form; and Sprengel gave popular lectures on the doctrine of the natural families of plants, in 1817. The great poet Goëthe also contributed his share, by means of a little book, long overlooked, in which he attempted, with the acumen of a true naturalist, to reduce the principles of vegetation to simple laws, and to explain, in a general manner, the various phenomena of apparently different organs. In consequence of Goëthe's views, which were continued by others, the Germans felt themselves powerfully attracted to the necessity of considering the organs of plants, according to their metamorphoses; and they now speak in botany of a *morphology*, which may otherwise be termed organography viewed in the light of all changes of phenomena appearing *in the leaf.* Ever since Hedwig, the founder of muscology, and of Persoon, the founder of mycology, a great inclination has been observable among the Germans for the study of the Cryptogàmia. This study became, as it were, the key to higher views, by making its followers acquainted with the simplest parts of the organs of plants. Nees von Esenbeck entered into the examination of mushrooms in a morphological sense, and the result of his labours, notwithstanding his numerous theoretical speculations, excited, by the soundness of his views, an interest for such delicate and difficult investigations. Link, Röper, and E. Meyer pursued the road pointed out by Goëthe: particularly the first, whose views were peculiar to himself; and Von Martius, who sought the metamorphosis of the leaf in its evolution round the axis of the plant, and endeavoured to explain, from this circumstance, the variety of flowers. Cotta, Meyer, and Gærtner have done much in the physiology of plants, with respect to the history of vegetation, the functions of the organs, fructification, and anomalous productions; in which Gærtner, the son of the great carpologist, repeated and extended Kälkbrenner's experiments. The discoveries of the Germans in phytotomy are very considerable. Sprengel, Link, Rudolphi, Moldenhauer, and Treviranus have collected and observed with great industry, and Kiefer has united the different facts into the most comprehensive system. The geography of plants also, which originated with Humboldt, is now diligently cultivated; and the descriptive works, among which that of Kunth is the largest and most meritorious, contribute not a little to place this science on a sure foundation.

Zoology has been pursued according to the system of Cuvier, who, having received his education in Germany, has become the teacher and guide of the many Germans who visit Paris. Zoology and zootomy are so closely united, that, in most universities, they are taught by one and the same professor. The celebrated veterans, Sömmerring and Blumenbach, have excellent disciples in this branch in Bojanus, Tiedemann, Otto, Weber, Rudolphi, &c., who diligently investigate not only the larger animals, but also the minute zoophytes of the sea, &c. The view of natural families in animated nature, first proposed by Illiger, has been introduced into zoology through zootomy. Meigen, Gravenhorst, Tiedemann, and Ochsenheimer have done much in the branch of insects; and Klug, by his unwearied industry, has become the German Latreille. Von Bär, of Konigsberg, is a zealous observer of the inferior animals. The cabinets of Vienna and Berlin have been so much enlarged, that, in some respects, they outrival that of Paris. The mineralogical collections also, as well as the botanical gardens of Vienna, Berlin, Munich, and Göttingen, display riches which, twenty years ago, could hardly be met with in Europe, except in the Jardin des Plantes at Paris.

Upon the whole, it is pleasing to contemplate, in a country so various in its forms of government and religion, the zeal for the investigation of nature so universally diffused, and not, as in France, limited to one capital; and to observe the progressive advancement of science. It forms a picture of the intellectual improvement of man, which, in spite of all obstacles, verifies the old saying of *Plus ultra!*

Munich, Nov. 1828. W. J.

Art. II. *On Juvenile Museums, with an Account of a Boy's Herbarium.* By J. Rennie, A.M.

All children appear to be more or less fond of natural history, from their earliest years; and, were this natural propensity duly encouraged, an extensive acquaintance with natural productions might be obtained by young people, at little or no trouble or expense to their parents, and with great pleasure and interest to themselves. The three most obvious departments best adapted for this purpose are, botany, conchology, and mineralogy, and particularly the first. I do not speak upon conjecture or speculation; I can adduce more than one case in which I have seen such plans carried into effect, with a success far surpassing the most sanguine expectations that could have been previously formed; and, as particular examples are more apt to attract attention than vague or general remarks, I shall, as an illustration of my views, give a brief history of what has been, and may be, done in this way.

Account of a Juvenile Herbarium.

A boy, who is now eight years old, began, at the age of five, to collect plants, for the purpose of drying them, to form a little herbarium; but it may be necessary to state that he previously knew, by memory, the scientific names of many of our more common wild and garden plants, some of which names, indeed, were amongst the first words he had been taught to speak. It was in winter when he first commenced his herbarium; and this was so far an advantage, that the evergreens, such as *I*'lex, *H*édera, *B*úxus, &c., as well as mosses, particularly the larger *H*ýpna and Dicràna, are more easily dried than the succulent plants of summer; besides, they require less nicety in spreading and arranging the foliage and branchlets, which is the most difficult thing for a child so young as this to manage dexterously, so as to display the characters of a plant in the specimen.

The method pursued was, to lay the specimens evenly between sheets of thick blotting-paper, of the folio size, over which were placed a number of large books. The specimens were shifted every day, either into fresh paper, or into a dry part of the same sheet, to prevent moulding and rotting; and this daily operation of shifting the specimens, was always looked forward to with as much delight as to a holiday, or any other treat of juvenile interest. At the same time, it renewed acquaintance with the specimens, and served to fix their names in the memory by reiteration. There was another source of interest, however, which I must not overlook; the boy was not alone in his study, if I may be permitted to call it so.

The sister of our juvenile botanist is 18 months younger than he; and, at the time he began his collection, was little more than three years of age. Accustomed to imitate her brother in most things, the little girl begged to have some blotting-paper for her tiny specimens; and accordingly she had some given her, of an octavo size, as more easily managed. The reader will scarcely believe that the specimens, dried without assistance, by this child of three years of age, would not disgrace any herbarium in the empire; yet her little collection, consisting of several hundred plants, native and cultivated, is in existence to prove the fact.

These two children spent, and now spend, many a delighted hour in examining, arranging, or adding to their little collections: thus gaining a practical acquaintance with the works of nature, while other children are, to say the least, not so usefully or pleasantly employed. Out of doors, still more, their collection employs them, in active search for specimens, in all the fields within their reach. It is not to be supposed, however, that they could have done all this without being carefully directed, and their attention turned to what appeared likely to interest them: in this their mother was very assiduous; but as they have just been deprived of her by consumption, they have now lost their chief guide in forming habits of observation.

It is proposed that they shall next begin little collections of minerals and shells, as soon as appropriate boxes, drawers, &c., shall be constructed for their reception. An account of their proceedings in these departments, shall be furnished on some future occasion, as it may serve to stimulate others to follow their example. In the mean time, it may not be amiss to mention one method of making boxes for shells, &c.

Juvenile Cabinet for Shells.

In one of Miss Edgeworth's delightful little books for young people (I forget which), there is an account of a pasteboard tray, furnished with divisions, fitted to hold shells, &c., arranged according to their genera and species. As this is precisely what young people want, to give them habits of order and arrangement, such trays ought to be given them, or they may (as in the case of Miss Edgeworth's young friends) be taught to construct the trays themselves. The method of doing this may be found in an excellent little work, lately translated from the German, entitled the *Art of working in Pasteboard*, which, with its companion volume, the *Papyro-plastics, or the Art of working in Paper*, ought to be in the hands of all juvenile naturalists; for, next to the pleasure of collecting in the fields, is the pleasure of seeing specimens preserved neatly and in good order; and nothing is better fitted for this than pasteboard boxes.

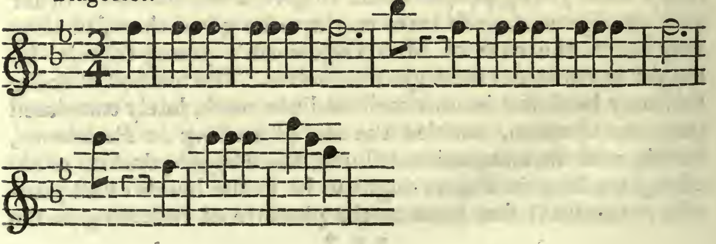
Lee, Kent, Dec. 16.

Art. III. *Sketches of Twenty-four American Song Birds.* By J. Rennie, A.M.

It was promised, in a recent Number (p. 347.), to disprove the opinion of Buffon, which has grown into a prejudice pretty generally diffused, that the birds of America are inferior in song to those of Europe; because, says the eloquent but credulous and mistaken naturalist, by living in a savage country, their voices become harsh and unmusical. But, before coming to particulars, I may be permitted to enquire, since birds sing in a pitch so irregular, and with intervals so unsettled, exhibiting a total disregard to measure and rhythm, what makes their music pleasing? The cause has been traced to association, for they seldom sing but in fine weather and when pleased; and, for the last reason, even the *sostenuto* of the cat is not unpleasing. The variety and rapidity of their notes and intonation also awaken attention; and the contrast between rapid flights of double-demi-semi-quavers, and lengthened and sweet minims, is often wonderful; such as the soft and sustained notes of the nightingale, succeeded by a short and expressive passage of quicker sound. It is perhaps too much to say, that we have borrowed all our music from birds, but some of it is evidently a plagiarism: for instance, the following German waltz: —

Flageolet.

Flageolet.



The cuckoo itself has done more for our music than musicians may be willing to allow; but it is no more than justice to a despised bird to say, that from it we have derived the *minor scale*, whose origin has puzzled so many; the cuckoo's couplet being the *minor third* sung downwards: thus,


*

Of the American song birds, the genus *T*úrdus seems to hold the chief rank, there being at least four species distinguished for their notes, among which is the Mocking-bird; to whose unrivalled music I shall presently advert, after disposing of his less distinguished congeners; none of which, be it remembered, belong to our European species. I must also premise that I am indebted to Wilson, the ingenious author of the *American Ornithology*, for almost all the details.

The Brown Thrush (*T*úrdus rùfus), sometimes called the Thrasher, or French Mocking-bird, is the largest of the genus. His song is loud, emphatic, and full of variety; and, in a serene morning, when the wind is hushed, and before the "busy hum of men" begins, his voice may be distinguished at the distance of half a mile. His notes are not imitative, as some have erroneously supposed, but are wholly his own, and bear a very considerable resemblance to those of the European song thrush (*T*úrdus mùsicus).

The Migratory, or Red-breasted, Thrush (*T*úrdus migratòrius) is an early songster, frequently commencing in March, before the snow has disappeared. One or two individuals usually taking the lead, by leaving the flock and perching on a stake or fence, to begin the prelude to the general concert. His song is not a bad imitation of the notes of the preceding (*T*. rùfus): but, though inferior to the brown thrush in execution, it is more simple, and what is deficient in talent is amply made up in zealous enthusiasm; so that his song is universally liked; and he is often, on that account, kept in cages.

The Wood Thrush (*T*úrdus melòdus) is a sweet and solitary songster. He chooses his station, at dawn, on the top of a tall tree, that rises from a low, thick, shaded part of the woods, piping his clear musical notes in a kind of ecstasy, the prelude or symphony to which strongly resembles the double-tonguing of a German flute, and sometimes the tinkling of a small bell. The whole song consists of five or six parts, the last note of each of which is in a tone that leaves the conclu-

* New Monthly Magazine, April, 1823.

sion suspended. The finale is beautifully managed, with so fine an effect as to appear sweeter and mellower at each successive repetition. Rival songsters, in different parts of a wood, seem to vie with each other in the softness of their tones, and the exquisite finish of their responses. During the heat of the day they are comparatively mute, but they renew their song at the close of day, and continue it long after sunset. Even in dark gloomy weather, during May and June, when scarce a chirp is heard from any other bird, the wood thrush sings from morn till night; and it may be said with justice, that the sadder the day the sweeter is his song. Those who have paid attention to the singing of birds know well that their voice, energy, and expression differ as widely as in man; and, agreeably to this remark, Wilson says he was so familiar with the notes of an individual wood thrush, that he could recognise him from all his fellows the moment he entered the woods.

The Mocking-bird (*Túrdus polyglóttus*) seems to be the prince of all song birds, being altogether unrivalled in the extent and variety of his vocal powers; and, besides the fulness and melody of his original notes, he has the faculty of imitating the notes of all other birds, from the humming-bird to the eagle. Pennant tells us that he heard a caged one, in England, imitate the mewing of a cat and the creaking of a sign in high winds. The Hon. Daines Barrington says his pipe comes the nearest to our nightingale, of any bird he ever heard. The description, however, given by Wilson, in his own inimitable manner, as far excels Pennant and Barrington as the bird excels his fellow-songsters. Wilson tells that the ease, elegance, and rapidity of his movements, the animation of his eye, and the intelligence he displays in listening and laying up lessons, mark the peculiarity of his genius. His voice is full, strong, and musical, and capable of almost every modulation, from the clear mellow tones of the wood thrush to the savage scream of the bald eagle. In measure and accents he faithfully follows his originals, while in force and sweetness of expression he greatly improves upon them. In his native woods, on a dewy morning, his song rises above every competitor, for the others seem merely as inferior accompaniments. His own notes are bold and full, and varied seemingly beyond all limits. They consist of short expressions of two, three, or at most five or six, syllables, generally expressed with great emphasis and rapidity, and continued with undiminished ardour, for half an hour or an hour at a time. While singing, he expands his wings and his tail, glistening with white, keeping time to his own music, and the buoyant gaiety of his action is no less fascinating than his song. He sweeps round with enthusiastic ecstasy, he mounts and descends as his song swells or dies away; he bounds aloft, as Bartram says, with the celerity of an arrow, as if to recover or recal his very soul, expired in the last elevated strain. A bystander might suppose that the whole feathered tribes had assembled together on a trial of skill; each striving to produce his utmost effect, so perfect are his imitations. He often deceives the sportsman, and even birds themselves are sometimes imposed upon by this admirable mimic. In confinement he loses little of the power or energy of his song. He whistles for the dog; Cæsar starts up, wags his tail, and runs to meet his master. He cries like a hurt chicken, and the hen hurries about, with feathers on end, to protect her injured brood. He repeats the tune taught him, though it be of considerable length, with great accuracy. He runs over the notes of the canary, and of the red bird, with such superior execution and effect, that the mortified songsters confess his triumph by their silence. His fondness for variety, some suppose to injure his song. His imitations of the brown thrush are often interrupted by the crowing of cocks; and his exquisite warblings after the blue bird, are mingled with the screaming of swallows, or the cackling of hens. During moonlight, both in the wild and tame state, he sings the whole night long. The hunters, in their night excursions, know that the moon is rising the instant they begin to hear his delightful solo. After Shakspeare, Barrington attributes in part the exquisiteness of the nightingale's song to the silence of the night; but if so, what are we to think of the bird which, in the open glare of day, overpowers and often silences all competition? His natural notes partake of a character similar to those of the brown thrush, but they are more sweet, more expressive, more varied, and uttered with greater rapidity. Mr. Jennings is so eager to make his readers believe that "during the day its chief notes consist of the imitations of the songs of its neighbours, while at night its song is more peculiarly its own," that he has repeated it in three several places of his *Ornithològia*. I must say that to me this has more the air of conjecture than of fact.

The Yellow-breasted Chat (*P*ìpra polyglótta) naturally follows his superior in the art of mimicry. When his haunt is approached, he scolds the passenger in a great variety of odd and uncouth monosyllables, difficult to describe, but easily imitated so as to deceive the bird himself, and draw him after you to a good distance; in such cases his responses are constant and rapid, strongly expressive of anxiety and anger, and while the bird is always unseen, the voice shifts from place to place among the bushes, as if proceeding from a spirit. At first are heard short notes like the whistling of a duck's wings, beginning loud and rapid, and becoming lower and slower, till they end in detached notes. There succeeds something like the barking of young puppies, followed by a variety of guttural sounds, like those of some quadrupeds, and ending like the mewing of a cat, but much hoarser. All those are given with much vehemence, and in different keys, so as to appear sometimes at a great distance, and instantly again quite near you. In mild serene moonlight nights, it continues this ventriloquism all night, responding to its own echoes.

The song of the Baltimore Oriole (Orìolus baltimòrus) is little less remarkable than his fine appearance, and the ingenuity with which he builds his nest. His notes consist of a clear mellow whistle, repeated at short intervals as he gleams among the branches. There is in it a certain wild plaintiveness and *naïveté* extremely interesting. It is not uttered with rapidity, but with the pleasing tranquillity of a careless ploughboy, whistling for amusement. Since the streets of some of the American towns have been planted with Lombardy poplars, the orioles are constant visitors, chaunting their native "wood notes wild," amid the din of coaches, wheelbarrows, and sometimes within a few yards of a bawling oysterwoman.

The notes of the Orchard Oriole (Orìolus mutàtus) are neither so full nor so mellow as those of the Baltimore, and are uttered more rapidly and gaily, while the bird is flying and caroling in a hurried manner, so that the ear can seldom catch all the tones. Among these there is one note especially which is very striking and interesting.

The Virginian Nightingale, Red Bird, or Cardinal Grosbeak (Lóxia cardinàlis), has great clearness, variety, and melody in his notes, many of which resemble the higher notes of a fife, and are nearly as loud. He sings from March till September, and begins early in the dawn, repeating a favourite stanza twenty or thirty times successively, and often for a whole morning together, till, like a good story too frequently repeated, it becomes quite tiresome. He is very sprightly, and full of vivacity; yet his notes are much inferior to those of the wood, or even of the brown, thrush.

Another bird of this genus, the Pine Grosbeak (Lóxia enucleàtor), sings extremely clear, mellow, and sweet, though not so loud as birds of its size generally do. A tame one sung, during the months of May and June, with much enthusiasm, for whole mornings together; and it acquired several notes of the Virginian nightingale, one of which hung near it.

The American Goldfinch, or Yellow Bird (*F*ringílla trístis), sings very much like the European goldfinch; but so weakly, that, even when perched over your head, the notes appear to come from a distance. In a cage he sings with great energy and animation. They are migratory birds; and, when they arrive in spring, great numbers of them assemble on the same tree, to bask and dress themselves in the morning sun, singing at the same time, in concert, most delightfully, for half an hour together.

The Indigo Bird (*F*ringílla cyànea) is fond of perching on fences about road-sides, and is a vigorous and pretty good songster; mounting to the tops of the highest trees, and chaunting for half an hour at a time. His song is a repetition of short notes, commencing loud and rapid, and falling by imperceptible gradations, till they seem hardly articulate, as if the little minstrel were quite exhausted. After a pause of about half a minute, he begins as before. Unlike most other birds, he chaunts with as much animation under the meridian sun in June as he does in a May morning.

The Song Sparrow (*F*ringílla melòda) is by far the earliest, sweetest, and most unwearied of the American song birds, sometimes continuing in song during the whole year. His note, or rather chaunt, is short but very sweet; somewhat resembling the beginning of the canary's song, frequently repeated for an hour together.

The whole song of the Black-throated Bunting (Emberìza americàna) consists of five, or rather two, notes; the first repeated twice and very slowly, the third thrice and rapidly, resembling *chip-chip, che-che-che;* of which ditty he is by no means parsimonious, but will continue it for hours successively. His manners are much like those of the European yellowhammer, sitting, while he sings, on palings and low bushes.

The song of the Rice Bird (Emberìza *o*ryzívora) is highly musical. Mounting and hovering on the wing, at a small height above the ground, he chaunts out a jingling melody of varied notes, as if half a dozen birds were singing together. Some idea may be formed of it, by striking the high keys of a piano-forte singly and quickly, making as many contrasts as possible, of high and low notes. Many of the tones are delightful, but the ear can with difficulty separate them. The general effect of the whole is good; and when ten or twelve are singing on the same tree, the concert is singularly pleasing.

The Scarlet Tanager (Tánagra rùbra) has a pensive monotonous note, like *chip, churr,* which appears distant, though the bird be near. At times he has a more musical chaunt, something like that of the Baltimore oriole. He is none of the meanest of the American songsters, and his plumage renders him a striking ornament to the woodland scenery.

The note of the Summer Red Bird (Tánagra æstìva) is a strong sonorous whistle, resembling a loose trill, or shake, on the notes of a fife, frequently repeated. That of the female is rather a kind of chattering, like a rapid enunciation of *chickey-tuckey-tuck.*

The Shore Lark (*A*laúda alpéstris, or *A.* cornùta) has a single chirp, exactly like the European skylark; and it is reported that, in the country where it breeds, it sings well while mounting in the air.

The Maryland Yellow Throat (Sýlvia marylándica) has a twitter not disagreeable, somewhat like *whitititee*, thrice repeated; after which it pauses for half a minute, and begins again the same ditty.

The Red-eyed Flycatcher (Sýlvia *o*livàcea) has a loud, lively, and energetic song, which is continued sometimes for an hour without intermission. The notes are, in short, emphatic bars of two, three, or four syllables. On listening to this bird, in his full ardour of song, it requires but little imagination to fancy you hear the words "Tom Kelly! whip! Tom Kelly!" very distinctly; and hence Tom Kelly is the name given to the bird in the West Indies.

The White-eyed Flycatcher (Muscicàpa cantàtrix) is a lively, active, sociable, little bird, possessing a strong voice for its size, and a great variety of notes, singing with much vivacity from April to September.

The Crested Titmouse (Pàrus bícolor) possesses a remarkable variety in the tones of its voice, at one time not louder than the squeaking of a mouse, and in a moment after whistling aloud and clearly, as if calling a dog, and continuing this dog-call through the woods for half an hour at a time.

The Red-breasted Blue Bird (Sýlvia sìalis) has a soft, agreeable, and often repeated warble, uttered with opening and quivering wings. In his courtship he uses the tenderest expressions, and caresses his mate by sitting close by her, and singing his most endearing warblings. If a rival appears, he attacks him with fury, and, having driven him away, returns to pour out a song of triumph. In autumn his song changes to a simple plaintive note, which is heard in *open weather* all winter, though in severe weather the bird is never to be seen.

The Marsh Wren (*C*érthia palústris) can scarcely be said to sing; but, when standing on the reedy banks of the Delaware or Schuylkill in June, you may hear a low crackling sound, as of air bubbles forcing their way through mud or boggy ground when it is trod upon. These are the singular notes of the marsh wren.

The notes of the House Wren (*Motacílla doméstica*) are loud, sprightly, and tremulous, repeated every few seconds with great animation, with a trilling vivacity extremely agreeable. The European who judges of the song of this species by that of his own wren (*Motacílla troglódytes*), will do great injustice to the American bird; for, in strength of tone and execution, the house wren is far superior. He may be heard on the tops of houses, even in towns, singing with great energy.

From these twenty-four examples, I think the position is fully made out, that the American song birds, so far from being inferior, are superior, to those of Europe, both in number and in the excellence of their music. I hope, therefore, that we shall hear no more of the untenable theories of Buffon upon this subject.

Lee, Kent, Nov. 24.

Art. IV. *Description and History of some of the principal British Insects: — Terminology.* By A. J. N.

Sir,

In complying with your request to furnish you with the natural history of some of the most important of our native insects, you must allow me to premise that my knowledge of insects has not been obtained from museums and books of plates, but from nearly half a century's observations in the open air as a farmer and gardener, assisted but by few other works than those of Linnæus. I shall not therefore trouble your readers with theories of classification, nor swell your pages with discussions on the recent innovations in nomenclature, but confine myself to those genera and species, which, being known to almost every body, have names in current use in general language. I shall always give the scientific names and the orders of Linnæus, and merely add one or two of the modern synonymes of the greatest authority among entomologists.

Insects (from *insectus*, cut or notched, *Lat.*), as Dr. Johnson informs us, are so called from a separation in the middle of their bodies, whereby they are cut into two parts, joined by a small ligature, as in the common fly. The history and description of insects constitute the science of entomology, a term formed from the two Greek words, *entoma*, insects, and *logos*, a discourse. Entomology is one of the principal branches of the study of natural history; and, though neglected or despised by the generality of mankind, as a pursuit of too trifling a character to engage the attention of a rational mind, yet, as has been wisely said of it, "the Creator, the more to illustrate his wisdom, power, and skill, has decreed that the minuter animals shall be more complex, in all respects, than the mighty monarchs of the forest or the flood."

When we contemplate the infinite number, variety, and formation of insects, consider their transmutations, economy, and powers, attend to their qualities, their utility or injury to mankind, and their important place in completing the chain of animated nature, we are filled with wonder and astonishment. The structure of these little beings, their various functions and curious manners, are of the most interesting description. Their instincts, for their own preservation or that of their progeny, almost exceed belief; and their ravages on the works of man, and on the objects of his care, are the immediate causes of vigilance on his part, which ultimately operates to his benefit in a great variety of ways. Many who have never had either opportunity or inclination to enter on the study of insects, may feel something like surprise when they learn that, besides being the plagues, and sometimes the ministers of vengeance, to humble the pride, and punish the indolence or ingratitude of man, they also supply the gorgeous habiliments of princes, the rallying ensigns of heroes, and the Tyrian dye for sacerdotal and magisterial vestments. From them are derived increments to the healing art, as well as to diet; and, above all, some of the lowest orders of these puny tribes, have even the power to change some of the features of the earth itself.

Before proceeding to the description of any insect, it is necessary to explain the terminology made use of by entomologists. I shall confine myself at present to terms of most frequent occurrence, and explain such others as I may find occasion to introduce, as they occur. Insects form the fifth class of the Linnean system of animated nature, the first, second, third, fourth, and sixth classes being quadrupeds, birds, amphibious animals, fishes, and worms. Insects are furnished with legs, a distinct head, and with horns or antennæ, which are supposed to be their organs of smell; they respire through pores in various parts of their body, but it is not certain that they respire through their mouths; they are, for the most part, oviparous. The greater number pass through three stages of existence; the egg or embryo state, the larva or caterpillar state, and the imago or perfect state: some, in their imago state, are only partially changed from their grub or caterpillar state, and a few undergo no material change whatever, after they are hatched from their egg or embryo.

Insects, in their imago or perfect state, are composed of four principal parts: viz. caput, the head; truncus, the trunk; abdomen, the hinder part; and artus, the members.

Càput, the head (*fig.* 180. *a*), is furnished with óculi, eyes (*b*), in number from two to eight; anténnæ, horns (*c*); os, the mouth (*d*), composed of làbrum supèrius, the upper lip, and làbrum infèrius, the lower lip; mandíbulæ, mandibles or lateral jaws (*e*); maxíllæ, lateral appendices of the mouth (*f*); gàleæ, shields of the mouth; lígula, a latchet, acting as a lower lip, situated under the jaws; língua, the tongue; róstrum, a movable beak; probóscis, the feeding trunk; haustéllum, the mouth of some insects, so called from its property of drawing up and folding under; pálpi, feelers; frons, the face; clỳpeus, the shield of the head; vértex, the crown of the head; and gùla, the throat (*g*).

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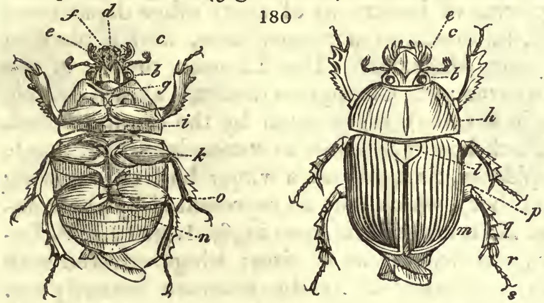
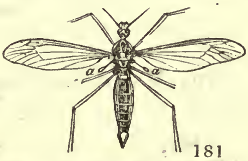


Trúncus, the trunk, consists of the thòrax, the part between the head and the base of the wings (*h*); péctus, the breast (*i*), to which the legs are attached, as also, in some cases, the wings and élytra; stérnum, the breast-bone (*k*); and scutéllum, a little shield, situate at the posterior part of the thorax (*l*). To the trunk are also attached àlæ, the wings; élytra, the wing-covers (*m*); and haltères, the balancers, exemplified in the common house-fly, and in *Típula.* (*fig* 181. *a a*).



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Abdòmen, the belly or third principal division, contains the intestines, ovary (*fig.* 180. *n*), &c.; and consists of the térgum, or upper part; vénter, the belly; caúda, the tail; and acùleus, the sting.

A'rtus, the members, are pèdes, the legs: composed of cóxa, the first joint (*o*); fèmur, the thigh (*p*); tíbia, the shank (*q*); társus, the foot (*r*); and únguis, the claw (*s*).

All these parts differ in form, colour, and consistence, as will appear in describing insects of the different orders. These orders, according to the system of Linnæus, we shall shortly enumerate. They are confessedly very imperfect, compared with the orders of the most improved modern systems; but they are nevertheless in such general use, and of such frequent occurrence in works of natural history, that a knowledge of them may be considered essential to every beginner. The more recent systems of insects, as of every other department of zoology, will, no doubt, at a proper time, find a place in the pages of your Magazine. The Linnean orders of the class Insects are seven; viz. Coleóptera (*koleos*, a sheath, *pteron*, a wing; wings in sheaths), represented by the common black beetle, dor, or clock-beetle, Scarabæ`us stercoràrius (*fig.* 180.); 2. Hemíptera (*hēmisu*, half, *pteron*, a wing; half of one wing overlaid by the other), which may be represented by the common cockroach, Blátta orientàlis (seen in *fig.* 1. p. 19.); 3. Lepidóptera (*lepis*, a scale, *pteron*, a wing; wings covered with very fine scales), represented by the common butterfly; 4. Neuróptera (*neuron*, a nerve, *pteron*, a wing; wings reticulated), represented by the dragon-fly; 5. Hymenóptera (*hymēn*, a film, *pteron*, a wing; wings membranaceous), represented by the bee; 6. Díptera (*dis*, twice, *pteron*, a wing; two-winged), represented by the common gnat; and 7. A′ptera (*a*, privative, *pteron*, a wing; no wings), represented by the spider and the centipede. In my next communication, I shall give the natural history of one of the most interesting of the coleopterous insects. I remain, Sir, &c.

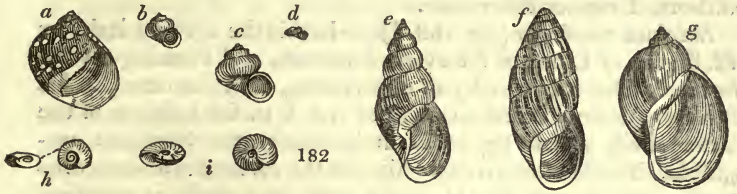
A. J. N.

Art. V. *Remarks on British Land and Fresh-water Shells.* By Mr. Joseph Kenyon.

Sir,

From the study of conchology in general, I have of late directed my attention more particularly to that branch which embraces our native land and fresh-water shells. On attempting, however, to make a systematic list, and refer each species to the works of the different authors to which I have access, I find the synonymes of several involved in much perplexity and doubt; and as some of your readers may probably be engaged in similar pursuits, and may have access to extensive libraries and cabinets, I beg to trouble you with a few remarks and queries, resulting from my late observations, in the hope of receiving benefit from the labours of those who are more experienced. The names of the species I may have occasion to mention will be those of Lamarck, when not otherwise distinguished.

Neritìna virgínea (*fig.* 182. *a*). — Is not this a fresh-water shell? Yet Dr. Turton describes it as found on the western coasts of Ireland. Will not Dr. Turton's shells, from their locality and diminutive size, prove another species?



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Valvàta piscinàlis (*b*). — Along with this species, of the usual magnitude, I have found dead shells, four lines in length (*c*), and several smaller ones of various sizes (*d*), agreeing pretty well with the species V. planórbis, V. ossirórbis, and V. minùta of Draparnaud, and which I have little doubt are all the young of the V. piscinàlis in different stages of growth, although Lamarck refers to them as distinct. Mr. Dillwyn is evidently wrong in considering this species to be the Túrbo thermàlis of Linnæus. The latter author describes his shell to be only a "little larger than a cabbage seed." The vague descriptions of authors often tend to confuse. Dr. Fleming, in the *History of British Animals*, just published, in his specific definition of this shell, characterises it as possessing "*a large central cavity*," but in his general description, a few lines lower, he says, "*central cavity distinct, but not large.*"

Lymnæ`a frágilis, Fleming (*e*). —This must be the Bùlimus frágilis of Lamarck, who, it evidently appears, has arranged this shell among his Bùlimi, in consequence of not knowing the habitat. He states his specimen to have been received from Dr. Leach.

Lymnæ`a detrìta, Fleming (*f*). — Does Lamarck include more than one species under his Bùlimus radiàtus; and, if so, is not this one?

Lymnæ`a ovàta (*g*). — What I consider to be this shell occurs in tolerable abundance in this neighbourhood. My specimens, several of them an inch in length, agree with the figures given by Draparnaud, but Lamarck describes his shell to be only $6\frac{1}{2}$ lines long. Is this the large variety of *H*èlix pùtris mentioned in Dr. Turton's *Conchological Dictionary*? What is the *H*èlix pùtris of Linnæus? Is it this shell, the Lymnæ`a péregra, or the Succínea amphíbia?

Planórbis nítidus (*fig.* 182. *h*). — Does not Lamarck include two species under this name, viz. the *N*aútilus lacústris (*i*), and *H*èlix fontàna of English authors? The description and reference to Draparnaud evidently belong to the latter shell; the references to Muller and Gmelin probably to the former, but not possessing the works of either of the two last-mentioned authors, I cannot determine.

Succínea amphíbia (*fig.* 183. *k*). — Is this the *H*èlix pùtris, or *H.* limòsa of Linnæus? Cuvier, Lamarck, and Fleming say the former. But it is worthy of observation, that Linnæus, in his *Systèma Natùræ*, refers to Gualter t. 5. f. H. for a figure of the latter shell, which figure is undoubtedly the Succínea amphíbia. The habitat given by him for the *H.* limòsa also accords better than that of the *H.* pùtris, with the shell in question. Did Linnæus possess a cabinet of the shells described by him in the *Syst. Nat.*; and, if so, did it, with his herbarium, get into the hands of the late lamented President of the Linnæan Society? Many difficulties might be cleared up on a reference to the shells, if in existence.

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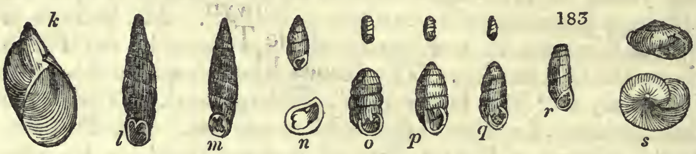


Clausília ventricòsa, Drap. (*l*). — I consider this to be the shell described by English authors under the name of Túrbo biplicàtus. Dr. Fleming is of opinion, however, that Draparnaud has not described our shell. The two specimens in my possesions, and which I received from that excellent naturalist, Mr. R. Leyland of Halifax, accord well with Draparnaud's figure, and very nearly so with his description.

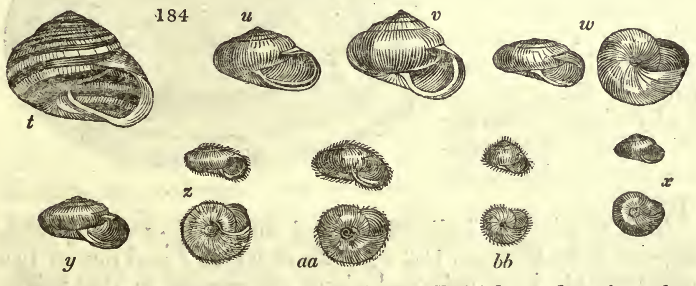
Clausília sólida, Drap. (*m*). — Is this the Túrbo labiàtus of English authors; and, if not, has the latter shell been described by any of the Continental writers, and under what name? I have not seen the shell.

Pùpa británnica (*n*). — I have ventured to give this name to the Túrbo trìdens of English authors, as the shell appears to be unknown among the Continental conchologists. It is not the Pùpa trìdens of Lamarck, and many of Dillwyn's synonymes are erroneous. Dr. Fleming places this species in the new genus Azèca, but appears dissatisfied with its station, and suspects it may eventually associate with his genus Carýchium; in this, however, he is incorrect, since the animal, in the latter genus, possesses only two tentacula, whilst the

Pùpa británnica, as I have lately ascertained from living specimens, is furnished with four. The shell in question in the Lamarckian arrangement agrees best with the genus Pùpa, and the specific appellation is untenable, and another necessary, not only to distinguish it from the P. trìdens of Lamarck, but to correct an error with regard to the number of its teeth, which, in reality, are five. The appellation P. quinquedentàta might have served, if some other species of this genus were not also furnished with five teeth. As there is already a Pùpa germánica, the specific name I have adopted appears to be as little exceptionable as any other, particularly if the shell be not really found out of this country. Should the Baron de Ferussac have noticed this shell by any other name, of course it will have the preference, as I am inimical to useless changes in nomenclature. There is no necessity for the adoption of the new-fangled genus Azèca. If Dr. Fleming considered he would be doing nature too much violence by placing this shell amongst his Pùpæ, he might have found an unobjectionable receptacle in the genus Chóndrus, established by Baron Cuvier.

Pùpa muscòrum. — This is much confused. There are three shells described by conchologists under this name and that of Túrbo *m*uscòrum (*fig.* 183. *o p q*), all referring to Linnæus; and Donovan has figured a fourth species, as his Túrbo *m*uscòrum (*fig.* 183. *r*).

H*èlix fúsca*, Turton, &c. (*fig.* 184. *s*). — Dr. Fleming suspects this to be the *H.* fúlva of Muller. The English shell is about half an inch in diameter, whilst the figure of that of Muller, given by Draparnaud, if I recollect rightly, is little more than a line.



H*èlix sylvática* (*fig.* 184. *t*). — Is this British, and under what name has it been described? Is it the *H.* lucòrum of Dillwyn?

H*èlix carthusianélla* (*u*). — I suspect this to be the *H*èlix cantiàna of authors (*v*), the *H.* pállida of Donovan.

Hèlix cellària (*w*), *nítida*(*x*). — Are these really distinct, or only the same shell in different stages of growth?

Hèlix rufèscens (*y*), Eng. auth. — This common shell seems to be extremely ill understood. Is it referable to none of the numerous species described and figured by Draparnaud? Circumstances which have tended to render it more confused, are, that English authors have followed each other in describing the immature shell to be hairy, and that the figure given by Donovan, plate 151. f. 1., under the name of *H*èlix híspida, is the *H.* rufèscens in a young state (*z*). The two shells are doubtless specifically distinct; the *H.* rufèscens is keeled on the margin of the outer whorls and smooth, the other rounded and hispid. It has been imagined that these hispid shells lose their hairiness, and add a keeled whorl to their former rounded ones, on arriving at maturity. This is fallacious. By carefully removing the whorls of the *H.* rufèscens with a knife, it will easily be perceived that they are all keeled. I possess specimens from one to seven lines in diameter. The small ones are as distinctly keeled as the large. Observations of a similar nature have also been made by my friend, Mr. William Helm, a most successful and industrious collector here.

Hèlix híspida (*aa*). — This species I take to be the hairy one, confounded with the *H*èlix rufèscens. Does the *H. t*úrturum of Gmelin belong to this or the last?

Hèlix serícea, Drap. (*bb*).—I consider this the shell called *H*èlix híspida by Turton, and several other English writers.

A'nodon intermèdius. (*fig.* 185.) — Is this an English species? The *M*ýtilus stagnàlis, dentàtus and avonénsis of Turton, &c., are ill understood; and some of them may, if really distinct from the A. *c*ycnèus and *a*natìnus, be referable to this species.

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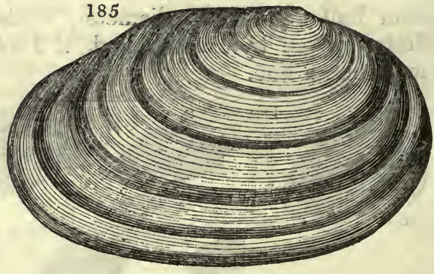


The number of indigenous land and fresh-water species, appears to be between 100 and 120, of which I and one or two other friends have collected about 60 species in this neighbourhood. Several described as rare, occur in tolerable abundance, whilst others which are represented as plentiful, have hitherto eluded our researches. I fear that a list of those discovered would be too unimportant to trouble you with, but should you be of a contrary opinion, it will be at your service.

In conclusion, I would just observe, that the making of mutual exchanges of specimens, from different localities, appears well calculated to further the objects of naturalists, and more particularly of those, situated like myself, whose avocations require an almost uninterrupted attendance on the spot.

I have the honour to be, &c.

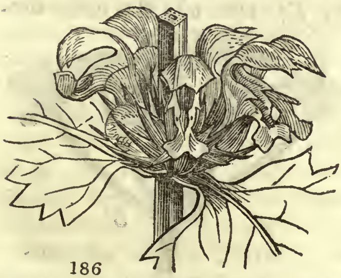
JOSEPH KENYON.

Butler Street, Preston, June 14. 1828.

ART. VI. *An Introductory View of the Linnean System of Plants.* By Miss KENT, Authoress of *Flŏra Doméstica, Sylvan Sketches,* &c.

(*Continued from* p. 238.)

WITH our last letter we concluded the third class, Triándria; before we proceed to the next, it will be well to give some preliminary explanation of the different modes of inflorescence. Plants bear their blossoms in as many different fashions as a lady wears her jewels; which fashions are called the *modes of inflorescence.* Some flowers grow on the stem, some on the leaves; some opposite the leaves, some in their axils; some laterally, some terminally; some singly, some in pairs, and others in clusters; and of these clusters there are various forms. The flowers of the dead-nettle grow in rings round the stem (*fig.* 186.): these rings are termed *whirls,* or *whorls;* and the flowers are either sessile (sitting close upon the stem) or have very short stalks. There is a plant now very common in gardens, called the Búddle*a* globŏsa, which affords a good specimen of the cluster called a *head* (*fig.* 187.): the flowers are collected into a round ball, by growing very near together upon one common stalk; they are mostly sessile, but have sometimes each a short stalk, by which it is attached to the common one. Lavender flowers grow in *spikes* (*fig.* 188. *a*): the spike has a number of flowers, either sessile or on very short stalks, laterally attached to the main flower stalk. A bunch of currants exhibits the *raceme:* it differs



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from the spike, in having the flowers visibly stalked, and all or nearly all in blow together; whereas those of the spike begin to blow at the base, and the lower ones are usually withered before the upper ones are blown. The raceme, too, is mostly pendulous (*fig.* 188. *b*); the spike erect (*a*). A spike is sometimes compound; being formed of many little spikes, or spikelets, arranged upon another stalk, as the flowers are arranged on the first. The *panicle* is a compound spike, only that the flowers have long stalks, which give the whole cluster a more loose and diffuse form; as in London Pride. (*fig.* 189.) An *umbel* has many stalks (called *rays*) collected together at the top of the stem, and spreading upwards in a hollow form, like the spokes of an umbrella reversed: each ray terminates in a flower, if it is a *simple* umbel; but, if the umbel is *compound*, it is crowned by a number of smaller rays, arranged in the same manner, which bear the flowers. The smaller are termed *partial umbels* (*fig.* 190. *a*); the main umbel is termed the *universal*, or *general*, *umbel* (*fig.* 190. *b*). A *cyme*, like the umbel, has many stalks meeting at the top of the stem; but these are irregularly subdivided before they terminate in the flowers; as in the elder tree. (*fig.* 191.) The *corymb* is a terminating cluster, of which the stalks are irregularly placed, but differing in length, so as to bring all the flowers very nearly to a level at the top. The *ament* has many scales set in an imbricated manner along a slender stalk, which serve as *calyces* to the flowers growing between them, as in many trees; the willow, birch, fir, &c. (*fig.* 192.) This

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sort of cluster is also called a *catkin*, from its resemblance to a cat's tail. Some persons reckon another cluster, called the *thyrse*; but this is merely a fuller kind of panicle, which assumes an ovate (egg-shaped) form.

We will now commence with the fourth class of plants, *Tetrándria*, distinguished by the four stamens in its blossoms. Some genera of this class might, at first sight, be confounded with those of the fifteenth; but the number of stamens would soon clear up any mistake of this kind; and when we treat of that class, we shall mention other distinctive characters. This class has three orders; Monogýnia, Digýnia, and Tetragýnia. Of the first order, we have fifteen British genera; among which are the teasel, scabious, madder, bedstraw, plantain, cornel, &c. Of the teasel, one species is used by clothiers to raise the nap of woollen cloth; whence it bears the name of Fuller's Teasel. It is a singular-looking plant, with a thick stem, 5 or 6 ft. high, clothed with several pairs of leaves at regular intervals: they are so combined (not only at the extreme base, but at their sides also, for an inch or more) as to form a sort of basin round the stem. Such leaves are botanically termed *connate* (*con*, together, *natus*, born, or grown). The reservoirs formed by their union collect the rain; sometimes containing half a pint or more; which sustains the plant during long drought. In desert countries, the weary and fevered traveller would sometimes exchange the whole of his property for the luxury of a draught from one of these water-lodging plants; but in this country the moisture is of more use to the plant itself than to the passenger or the possessor. The flowers are collected into conical heads, about the size of a hen's egg, upon a receptacle set with a number of chaffy scales hooked at their edges. (*fig.* 193.) When the flowers wither, these heads are set in frames, and drawn over woollen cloth to raise the nap; for which purpose the scales have just sufficient strength, yielding before they reach the cloth itself. This operation is called teasing, from which, most probably, the plant obtained its name. The botanical appellation, *Dípsacus*, is derived from the Greek, *dipsa*, thirst; though the plant is rather a reliever, than a representation, of thirst.


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The scabious also bears its flowers in heads, although in some of the species they are rather hemispherical than globular; they are so formed in the Sweet Scabious, that fragrant deep purple flower, which the Italians call *Vedovina,* Little Widow. We have three British species. The Field Scabious is of a very pale purple colour, which, being held a few minutes over the smoke of tobacco, gives place to a beautiful green. The species called the Devil's-bit Scabious has a blackish root, which appears as though the end had been bitten off; and this, it seems, is true. The devil, we are told, grudged mankind the benefits they were likely to receive from it, and bit off the greater part; it is from this malicious action that the English name is derived. Sir J. E. Smith observes that he has been completely successful, not only having shortened the root, but having left the remainder totally useless. Madder is used in dying red. Our British madder yields a dye inferior to the species commonly cultivated for that purpose, but it is frequently substituted for it, as is the yellow bedstraw also; and Curtis says it yields a finer red. This latter plant affords a good yellow dye, likewise; the flowers serve to coagulate milk, and were formerly used in the making of Cheshire cheese.

The plantains, which are generally overlooked as plants unworthy of note, are very pretty and delicate. Most of the species spread their leaves on the earth, in the form of a star; they are elegantly shaped, and marked with many parallel ribs. The flowers, though small, are numerous, and grow in close spikes; the silvery corollas, some full blown, others just peeping from their green calyx, their long pink filaments, and the large white anthers, so slightly adhering to them as to be in a continually tremulous motion, are well worthy of attention. The seeds afford a grateful supply of food to many small birds; as also does the cornel tree. This tree, frequently called dogwood, and mentioned by Chaucer under its old name of gaitre tree, was formerly in high repute for the making of spears. An oil for the lamp may be obtained from the berries; which are black and bitter. The fruit of the dwarf cornel is red, sweet, and palatable; and was formerly preserved in the form of rob, or made into wine.

Among the foreigners of this order are many handsome genera, chiefly from the Cape and New Holland. The Búddle*a* globòsa (named from Adam Buddle, and from the globular clusters of its flowers) before mentioned is a native of Chile; the clusters look like little balls of honeycomb, and have both the colour and scent of honey. Sandal wood (*Sántalum* álbum) is an East Indian shrub of this order. One peculiarly magnificent genus is the Pròte*a:* one species of this is called the Silver Tree (Pròte*a* argéntea), the leaves have the softness of satin, with the brightness and whiteness of silver; others of this species are called Golden Proteas; one, more especially, has a leaf of golden green edged with scarlet, and appears, at some distance, like a flaming fire.

We have but one genus of the second order, and that is a doubtful native, containing only one species, Buffòn*ia* tenuifòlia (Slender-leaved Buffonia). Sauvages gave this plant its generic name in honour of Buffon; and it is believed that when Linnæus added the specific appellation, he alluded not only to the slender leaves of the plant, but also to the slender claims of the French naturalist to any *botanical* honours. Linnæus was fond of these allusions, and hence the conjecture may have arisen, perhaps without foundation.

Of the third order, Tetragýnia, we have seven genera; of which number is the holly (*I*`lex *A*quifòlium), a beautiful evergreen, which we may look upon with pleasure, as associated with the festivities of Christmas; but which the poor birds have little cause to delight in, since it furnishes the lime by means of which they are made captive. An old holly tree which has become smooth with age (for age deprives the leaves of their spines) is a noble object, more especially when adorned with its bright scarlet berries. There are many foreign species of this genus. The leaves of the South Sea tea tree (*I*`lex vomitòria) are made, by the natives of the South Sea Islands, into a medicinal tea, which, at certain seasons of the year, they drink to excess.

We are now to consider the fifth class, *Pentándria*, which includes nearly a sixth part of the vegetable world; the first two orders, in particular, are very extensive, comprehending nearly the whole class, though it is divided into seven.

Of the first order, Monogýnia, the British Flora comprehends forty-one genera; it is subdivided into several sections; the first of which consists of a natural family of plants, called Asperifòliæ (harsh-leaved), and contains ten genera. Their flowers are *monopetalous* (one-petaled), *inferior*, and have two or four seeds, which lie naked at the bottom of the calyx. By *inferior*, we do not mean in quality, as some young learners suppose, but in situation. When the corolla or calyx envelopes the fruit, the flower is termed *inferior*, being *below* the fruit; if the corolla or calyx sits upon the top of the fruit (*fig.* 194.), it is called *superior*, being *above* the fruit.

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The flowers of this section are chiefly blue, varying to red, sometimes in the selfsame blossom, and mostly pink in the bud. They grow in clusters, which, when in bud, curl round like the tail of a viper, and gradually lengthen and straighten as the flowers blow. The calyx is of one leaf, usually five-cleft; the corolla of one petal, tubular in the lower part, the upper cut into five segments. The stamens are concealed within the tube, the mouth of which is frequently closed by five little valves, which meet in the centre. In these characters, all the ten genera agree; as they do, also, in having flowers as delicate, as the herbage is coarse. One interesting plant, the Forget-me-not (*M*yosòtis palústris), has the bristles of its leaves so fine, as scarcely to render them rough either to the eye or to the touch. This plant grows about a foot high, with oval leaves, of a bright green, somewhat shining and sessile; the flower is about a third of an inch in diameter, of a delicate blue, with a yellow eye, formed by the valves before mentioned; it grows in marshes, and by the sides of brooks and rivers. Other species are frequently mistaken for this, but they have smaller flowers, and the eye is not so bright as in the true Forget-me-not; which we speak of thus at length, because it has been repeatedly celebrated by poets of different countries, is respected in Germany as the emblem of affection, and is deserving of notice from its own beauty. (*fig.* 195.)

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The second section of this order contains sixteen genera, which, like those of the first, have their flowers *monopetalous* and *inferior*, but have numerous seeds, enclosed in a covering called a *capsule* (casket). Of this section are many of our favourite flowers: the convolvulus, which twines around its neighbours, and frequently conceals them with its numerous stems and heart-shaped leaves; the primrose, which we all hail as the pretty pale herald of the spring; the periwinkle, which crowds its fine evergreen leaves into clumps and tufts, flourishing in shades too confined for most plants to thrive in; the water violet, a tall showy plant, which conceals its leaves under the water, and erects its large flowering head two or three feet above it; the mullein, with its tall golden pyramids rising from a bush of leaves, so thick, soft, and downy, as to serve the Russian peasantry for socks in their rigorous winters; the shepherd's weatherglass (so named from the warning it gives of coming rain, by the closing of its corolla), which, with the exception of the poppy, is the only scarlet flower indigenous of Britain; and the nightshade or bittersweet (*S*olànum Dulcamàra), which wears a necklace of pearls, and produces one of the most elegant berries that the vegetable world can boast; shaped like an egg, and sparkling like a ruby. To this last genus belongs our domestic friend, the potato; said to have been first brought to Ireland by Sir Walter Raleigh, and thence introduced into England. Most species of the Solànum are poisonous, and the potato is so, in some degree, before it is exposed to the action of fire. The plant known by the name of the Deadly Nightshade (A'tropa Belladónna) is of another genus, contains a most virulent and powerful poison, and should never be suffered to grow in the public way. It has, indeed, on this account been so frequently eradicated, that it is now a very rare plant. It bears a large handsome purple flower, and is honoured with the appellation of *Fair Lady*. The generic name is derived from Atropos, one of the Fates. "How the same plant should come to have the gentle appellation of *Belladonna*, and the tremendous name of *Atropa*, seems strange, till we know that it was used as a wash, among the Italian ladies, to take off pimples and other excrescences from the skin, and are told of its dreadful effects as a poison," observes Rousseau.

The third section contains six genera, with flowers *monopetalous* and *superior*: of this number are "the gadding woodbine," with its honey-bearing trumpets; and the campanula, of which genus is the delicate little heath-bell, that nods on the summit of a stalk so slender as to appear supported by magical influence. Many persons call this the *hare-bell*, but the true *English hare-bell* is the English hyacinth (Scílla nùtans). These two plants have been frequently confounded by poets; but, according to Sir J. E. Smith, the little campanula, which we call the *heath-bell*, is the *hare-bell* of Scotland, while the *hare-bell* of England is the Scottish *blue-bell*.

The fourth section has four genera; with flowers *inferior*, and four or five petaled. To this section belongs that beautiful genus, the violet. *H*édera, the ivy, and *Rìbes*, the currant bush, are the only two genera composing the fifth section; their flowers are five-petaled (*pentapetalous*) and *superior*. The sixth section has flowers without petals (*apetalous*); it contains three genera.

This class and order, though it contains a great number of splendid and truly beautiful plants, and is remarkably extensive, is by no means the most important to mankind. Beauty, however, is not its only claim to consideration, as will readily be acknowledged; for it has a fee to purchase praise from every class of society: it is in possession of the tobacco plant of Virginia, of the coffee tree of Arabia, and of vines from various parts of the world: these will insure it respect, even from those who deny it to the elegance, the splendour, and the fragrance of its fine flowers.

(*To be continued.*)

Art. VII. *Contributions towards a Flòra Hibérnica. Being a List of Plants not before observed wild in Ireland: together with New Localities for a few of the more Rare Ones.* By Edward Murphy, Esq. A.B. Trin. Coll., Dublin.

The plants in the subjoined list were principally observed in a botanical and geological tour, which I made for the North-west of Ireland Society, in the summer of 1826. Circumstances have retarded, hitherto, the publication of the *Catalogue* drawn up for the Society, but their object in instituting researches of this nature being to make known the natural history of the district with which they are more immediately concerned, it will readily be conceded that the means best calculated to attain that end is to record, from time to time, any discoveries which may be made.

My investigations were confined to the counties of Tyrone, Donegal, and Derry; and, having been undertaken in May, after the early phænogamous and most of the cryptogamous plants had disappeared, they were not by any means so successful as, under more favourable circumstances, it is reasonable to suppose they would have been. But, indeed, the north of Ireland, and particularly the portion of it above mentioned, is far from fertile in botanical treasures. The surface of Tyrone and Derry, with the exception of a few basaltic façades in the north of the latter, consists of a succession of low rounded hills, invariably covered to their summits with bog, and producing only a fatiguing repetition of the *E*rìcæ, Erióphora, *S*círpi, and *C*árices, common to such situations. Donegal, though possessing great variety of soil and surface, and the mountains of which, in elevation and the other requisites, are to appearance peculiarly adapted to the growth of alpine plants, is notwithstanding extremely unproductive. I have no hesitation in saying, that a greater number of *rare plants* may be found in one glen in Carnarvonshire than is afforded by this entire district. That other parts of this country however, are not uninteresting, in a botanical point of view, is abundantly evident in the great variety of plants observed by Mr. Drummond in the county of Cork, as well as in two or three autumnal excursions by the late Dr. Wade and Mr. M'Kay, a catalogue of all of which was published by the last-mentioned gentleman in 1825. In climates favourable to vegetation, the variety of plants is generally proportional to that of the soil and surface, and when it is known that scarcely a rock of any extent has hitherto been discovered, the prototype of which does not exist in this country, as it already is that its mountains exceed for the most part in elevation those of England, and are little inferior to those of Scotland, we may confidently premise that its botany will, when adequately investigated, be found equally respectable with that of the sister countries.

The following Plants do not appear in Mr. M'Kay's Catalogue.

Valeriàna dentàta. Ann's-brook, Meath.
*P*hálaris *a*rundinàcea. Margins of lakes, ditches, &c.; common.
This plant had been observed by Mr. M'Kay, but was omitted in his list by mistake.
*P*otamogèton perfoliàtum. Canals about Dublin, and in rivers and lakes; common in the north.
P. gramíneum. Lakes in Fanet, Donegal.
*S*càndix odoràta. Way-sides and plantations; common.
This plant may have been introduced; but the like remarks will apply to many received as indigenous.
*P*olýgonum vivíparum. Northern declivity of Benbulben mountain, Sligo.
Pýrola rotundifòlia. Glen-Idra, Derry.
Arenària vérna. Magilligan, Derry.
A. trinérvis. Strabane Glen, Tyrone, and Glenade mountain, Leitrim.
*R*ùbus Chamæmòrus. Plentiful on Glen-Garro mountain, Tyrone.
Subulària aquática. Lough Carban, a little north-west of the Gap of Barnesmore, Donegal.
*E'*rvum tetraspérmum. Ann's-brook, Meath.
Aspídium *L*onchìtis. In a glen east of Lough Esk, Donegal, and on Glenade mountain, Leitrim.

New Habitats for Plants before observed.

*S*círpus aciculàris. Canal at Strabane, and margin of Lough Foy, Derry.
Seslèr*ia* cærùlea. On all the calcareous mountains of Leitrim and Sligo.
*P*òa alpìna var. vivípara. Benbulben, Sligo.
*E'*lymus arenàrius. Bundorn and Aranmore, Donegal.
*G*àlium boreàle. Magilligan, Derry.
*C*entúnculus mínimus. Rosses and Fanet, Donegal.
Rhodìola millegràna. With the last.
Drósera longifòlia. Flow bogs; common.
*P*hellándrium aquáticum. Canal near Dublin.
Oxýria renifórmis. Benbulben, Sligo.
Pýrola mèdia. Ards, &c., Donegal.
Chrysosplènium alternifòlium. Ballylast, Tyrone.
*S*axífraga oppositifòlia. Calcareous mountains of Leitrim and Sligo.
*S. a*izöìdes. With the last.
Silène acaúlis. With the last two.
*R*ùbus suberéctus. Common in Leitrim.
R. saxátilis. Ards, &c., Donegal.

*P*apàver cámbricum. Benbulben, Sligo.
*S*tratiòtes *a*löìdes. Canal near Drogheda.
*R*anúnculus hirsùtus. Magilligan, Derry.
Tróllius Europæ`us. Convoy and Lough Gartan, Donegal.
*O*robánche rùbra. Ards, Donegal.
*T*hláspi arvénse. Magilligan, Derry.
*D*ràba hírta. Limestone mountains of Leitrim and Sligo; plentiful.
*G*erànium sylváticum. In a field adjoining Dunluce Castle, Antrim.
*H*ypéricum *A*ndrosæ`mum. Of common occurrence in this district.
Eriocaúlon septangulàre. Abundant in the lakes of the Rosses, Donegal.
Lycopòdium alpìnum. Aghla and Barnesmore mountains, Donegal.
Isöètes lacústris. Lakes in the Rosses, Donegal.

Art. VIII. *On the Natural Order of Plants, Dicotyledòneæ,* Anonàceæ. By Mrs. E. Bowdich.

It is one of the peculiar beauties of the natural system, to be so frequently able to recognise the general qualities of a plant, by merely referring to the name of the order to which it belongs. The physiological portion of botany places it among the most important of those studies furnished by nature; and the mere repetition of long names, the counting of petals and stamina, &c., are, by uniting them to the uses of plants, raised into a science which benefits mankind.

The family of *Anonàceæ*, composed of trees and shrubs, is one of the most natural of the different orders, and presents, not only a strong similarity of appearance, but a remarkable analogy in the qualities of its species. Its existence is mostly confined to that portion of the globe contained between the tropics; it is eminently beautiful, and not less useful to the natives of the countries to which it is indigenous. Almost all the individuals classed in it possess a strong aromatic or pungent odour, which is shared by the roots, the bark, and even the leaves.

The period of its discovery is not exactly known; but the *Anòna* squamòsa is mentioned by Oviedo in his work on America, published in the year 1546. In 1548, we hear of the Ethiopian, or Malaguetta pepper; and, in 1648, three or four of the Brazilian species were described. Rheede mentioned the Malabar species in 1703; since that, one has been discovered in New Holland; and, still more recently, Palisot de Beauvois speaks of several belonging to Africa. There are, probably, many more hidden in the immense forests of that continent, of which we have so imperfect a notion.

The flowers of the *Anonàceæ* vary in form, but the petals are generally thick and coriaceous; they are mostly red, white, and yellow, and none have yet been discovered of a blue colour. The genus *Kadsùra* is the only example of dentated leaves; and these leaves, when steeped in water, yield an abundant mucilage, used by the Japanese in the fabrication of the paper made from the Broussonèt*ia* papyrífera. The women of Japan also rub it on their hair before their heads are shaved.

The genus *Anòna*, mentioned by Oviedo under the name of *Guanabànus*, but established as the *Anòna* by Linnæus, bears fruits, each of which consists of a many-seeded berry, so formed by the junction of several one-seeded berries. They are generally good to eat; but are said to be unpalatable to Europeans at first. We have heard, however, of their being sought with avidity after one trial. The *A.* muricàta, coming from South America, and the western coast of Africa, yields what the English call the sour-sop, which is a large oblong fruit, filled with a white, watery, and acid pulp, enveloping many large, shining, black seeds. It is very cooling and refreshing, and reckoned wholesome. The *A.* squamòsa, from both India and Africa, bears a beautiful green berry, the size of a small pine-apple, and resembling it in form. There is so much saccharine matter in it, that the sugar, oozing through the rind, crystallises on the outside, and gives it a very pretty appearance. It is extremely luscious in taste. The *A.* reticulàta gives us the custard-apple, which is about the size of one of our largest apples, and is filled with a yellow cream-like pulp, and in flavour is very similar to a newly made custard. It is indigenous to the Caribbee Islands, and grows in Africa and Malabar; it has also succeeded in the Island of Madeira. The fruits of the *A.* paludòsa (*fig.* 196. *a*), *A.* palús-

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tris, *A.* longifòlia (*e*), and *A.* glàbra, are also much esteemed for their edible properties. Those of the *A. Cherimòlia* (*b*) are reckoned among the best fruits of Peru, and have an agreeable vinous flavour. The roots of the *A.* asiática are employed in Ceylon for making a red dye, and those of the *Araticù pônha* are so large, and at the same time so light, that the Indians of South America make shields from them. The leaves of the *A. Ambotày* (*f*), and the *A.* muricàta, are applied, with effect, to wounds, to promote suppuration. The wood of the *A.* palústris is so soft and pliant, that it is used instead of cork.

From the fruits of the *Asímina* tríloba, or *Anòna* tríloba according to Linnæus, a spirituous liquor has been extracted; and Duhamel says that, although the pulp may be eaten, the rind is so acrid, that, if the eyes are touched with the fingers after handling it, they become inflamed. This, however, wants confirmation.

The wood of the genus Porcèlia is used in Peru for beams and rafters; the fruits are edible, and a yellow dye may be extracted from the leaves.

The fruits of the genus Uvària are not yet fully known; but those of the U. zeylánica are supposed to resemble an apricot in flavour.

Among the species of the genus *Unòna* we find the *U.* æthiópica, so well known on the western coast of Africa under the name of Malaguetta pepper. It is a sovereign remedy, among the natives of that country, for rheumatism, weakness of limbs, headaches, or, in fact, any local pain. It is bruised in water, so as to form a paste, which is rubbed on the part affected; a bandage is added, and the patient is immediately covered with a quantity of clothing. In a short time a very agreeable tingling of the skin commences, which is succeeded by a general glow, and, subsequently, a violent perspiration. Europeans have spoken highly of it, as a remedy, from their own experience. The roots of the *U. Nàrum* are used for various complaints, both in Malabar and in the Moluccas; and a strong-smelling oil is extracted from the bark, which also enters into the list of medicines. The bark of the *U.* tripetalöídea affords a gum of delicious odour. The flowers of the *U.* odoràta (*c*) have a very aromatic smell, similar to that of European pinks. It is much cultivated on this account; and the Japanese decorate their persons, and even their beds with it. The *U.* undulàta affords, in the bight of Benin, one of the best spices of Owaree.

The genus Xylòpia also yields agreeable spices, and the wood of the X. frutéscens (*d*) is so flexible as to be employed for cordage.

The leaves of the genus Guattèria have, in general, a very acrid and aromatic taste; they are applied in rheumatic cases, and an extract from them is given in Malabar at the commencement of intermittent fevers. The flowers of the G. virgàta (*g*) possess a delicious fragrance.

Assembling, as we do, in this country, and easily procuring, every thing that is useful and ornamental, it may be a mere matter of amusement thus to sketch the uses of foreign plants: but could we, for a moment, imagine ourselves out of the reach of European assistance and European luxuries, we should be glad of every resource presented to us by nature, and congratulate ourselves on possessing a knowledge of her treasures. In all primitive countries where vegetation is luxuriant, it supplies every department of life with a mine of wealth. Not only is it employed in the construction of edifices, weapons of offence and defence, household utensils, and musical instruments; but it affords clothing, ornaments, food, medicines, and is, even, the great source from which rude people draw their poetry and romance.

The physiological botanist, therefore, possesses great advantages when travelling in these wild countries; and it has been observed, that the respect felt by savages for this sort of knowledge increases their confidence in strangers, and gives them a favourable impression of the omniscience of civilised Europeans.

Art. IX. *On the Leaves of Maláxis paludòsa.* By the Reverend John Stevens Henslow, Professor of Botany in the University of Cambridge.

Sir,

In the fourth volume of the *English Flora*, Sir James Smith has described the leaves of Maláxis paludòsa, as "roughish about the extremity, often somewhat fringed, so that this plant may perhaps have given rise to the report of a hairy-leaved Orchis," &c.

This plant occurs in great plenty in the bogs on Gamlingay Heath, Cambridgeshire, where I had an opportunity of examining it a few days ago, and ascertained the cause of the fringed appearance of the leaf, alluded to by Smith. Every specimen I gathered exhibited this in a greater or less degree, and it required only the assistance of a common lens to show me that it was occasioned by numerous little bulbous germs, sprouting from the edge, and towards the apex of the leaf, as represented in the accompanying sketch (*fig.* 197. *a b*). They were of the same colour as the leaves, green on those which were more exposed to the light, and quite white on those which were lowest on the stem, and half buried in peat and moss.

Some of these germs were so far advanced as to have put forth the rudiments of two or three leaves (*c d*); others less so (*e f*).

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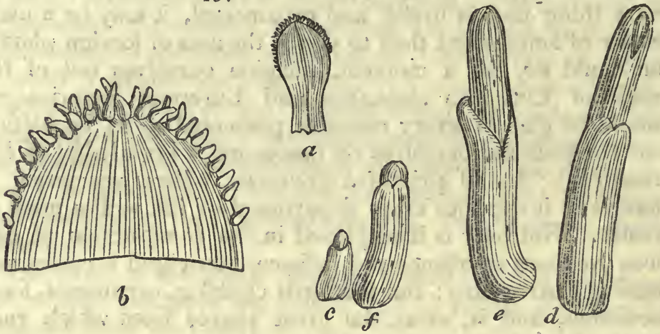

These plants often occur in little clusters of half a dozen or more close together, which may be accounted for by several of the germs arriving at perfection, whilst the rest perish. Otherwise, so far as I have observed, the plant is generally continued by a single offset, and three or four of the old decayed bulbs may be found, one below the other, among the peat, and still attached to the living stem.

This and Maláxis Loesèl*ii* are probably truly parasitic.

I remain, Sir, &c.

Cambridge, *Aug.* 14. 1828. J. S. Henslow.

Art. X. *Progress of Geology.* By R. C. T.

In a former article (p. 249.), devoted to the consideration of two interesting geological memoirs, it was judged a fitting opportunity to contribute a series of preparatory illustrations of stratification, partly original, and the remainder selected from authentic data.* If we deviated somewhat from the strict course of an elementary treatise, and brought forward matter which should have formed a section at a more advanced stage, it will, perhaps, be conceded that those details were not unseasonably introduced. Our progress will henceforth be more regular. In the limited space which can here be appro-

* During the progress of this article, all the illustrations which are not expressly accounted for, may be considered as original.

To those who are familiar with the gigantic scale on which the geology of some other countries is exhibited, the examples we have selected may appear trivial; but it must be remembered that our main design is the illustration of *English* geology.

priated to this department of natural history, condensation of facts and opinions is indispensable. All that can be undertaken is an outline of characteristic features. Those of our own country naturally demand our earliest and chief attention; and it appears expedient, for the present, to reserve for some future article the subject of continental geology, and its relations with this island. In briefly tracing the rapid progress of the science, we shall derive gratification from enumerating many successful investigators and distinguished authorities.

The necessities of man, doubtless, led him, in the first instance, when in search of the useful productions of the mineral kingdom, to take cursory notice of the rocks in which those substances were embedded. As his wants and luxuries multiplied, his knowledge of the earths, of the metals, coals, stones, and marbles, their uses and properties, increased, and his observations necessarily became more minute. Such observations would be essential to save labour, and to acquire those valued productions at the smallest cost, and at the least sacrifice of time. To accomplish these objects, he found it necessary to study obscure indications; and, however imperfect the evidence and scattered the data, to trace the subjects of his search, to mark their position, and to define the extent of their depositories. Thus far advanced, he began to reason on the nature of those substances, on the phenomena observable in their matrices, on the origin of those singular organic forms incorporated in the solid rocks, and on the infinite variety manifested in their structure, their situations, and attendant circumstances. Hence originated his first geological speculations, which were not unmixed with a portion of superstition. Surrounded by so many interesting objects, of which all his reasonings could not afford a satisfactory explanation, his imagination readily suggested a solution of those difficulties which his ignorance of natural science left unaccounted for. He observed every where, whether on the earth's surface, or in its profoundest depths, traces of a different state of things at some vastly remote period. With that sensation of awe, which the sublimity of such scenes would inspire, he viewed the uplifted peaks, and pinnacled summits of the primitive mountains, piercing through the clouds, covered with perpetual snows, and inaccessible to human foot. In their neighbourhood he saw other rocks, of somewhat less rugged and imposing contour, whose masses every where bore marks of violent disturbances, and contained within them the substances best adapted for his domestic purposes. Beyond these rocks he observed a numerous group of others, of yet more softened outline, with surfaces more favourable to cultivation; and in whose structure were mingled myriads of organic bodies, whose forms in some cases were unknown to him, and in others nearly resembled those of the existing inhabitants of the ocean. Stretching further were vast plains and gently rounded eminences, composed of less indurated materials, and bearing internal evidence both of their marine origin, and of the subsequent action of mighty waters upon their disturbed surfaces. Amidst the fragments that overspread these plains, he occasionally discovered bones of gigantic animals, which furnished matter for the wildest conjectures, and most extravagant speculations. All these phenomena led irresistibly to the conclusion, that the earth had undergone some stupendous revolution, which, as corroborated by Mosaic testimony, had "broken up the fountains of the great deep," and "destroyed every living substance which was upon the face of the ground."

But it was not then anticipated that these extraordinary appearances in the earth, the peculiarities of its structure, the alternation of its materials, and the multitude of intermediate gradations, indicated many separate geological epochs, many destructive revolutions, and many intervals of repose and reproduction. Amidst the chaotic confusion of the lofty mountain ranges, amidst the perplexity, the dislocations, and distortions of those rocks which occupied less elevated and more habitable regions, no traces of original order were perceived. In the rocks which were crowded with organic remains, no distribution of species in particular beds or portions, no regularity of superposition, no undeviating arrangement, no succession of strata, traversing whole countries, could yet be discerned. Their relative ages, the comparative eras which are determinable by positive evidence, such, for instance, as the deposition of a series of horizontal over inclined beds, were then unsuspected.

The animal remains, it is true, were too singular to be overlooked. Absurd notions were promulgated of their origin, and although many of the most remarkable were collected for their rarity or their beauty, no idea was then entertained of their applicability in identifying the strata, and their superior adaptation as geological tests.

Then arose those innumerable chimerical theories, flowing from an imperfect knowledge of facts, or founded on circumstances not universal; on phenomena and reasonings applicable to minute portions of the surface, rather than to the entire globe.

As no science invites speculation more than geology, the press, during the last century, teemed with systems, which in turn were advocated and renounced by the philosophers of the day. To detail these would be an obvious waste of time. They were only so far useful, as they promoted discussion, and excited enthusiasm in controversy, and as their results were deeper examination and sounder views.

Geology may, in truth, be classed with the modern sciences, since it is so recently as the year 1815 that the first geological map of this, or probably of any other country, was produced In referring, thus early, to that great undertaking, it is scarcely necessary to premise, that it was designed to exhibit the boundaries of the various classes of rocks, strata, and deposits, in this kingdom; to define the areas they respectively occupy; to determine, with greater precision, the position of such strata or substances as are subservient to the purposes of man; and, at the same time, by ascertaining the actual condition and arrangement of the several formations, to furnish more accurate data than were before possessed, whence to judge of the nature of those stupendous changes to which our planet has been subjected.

Prior to a period which perhaps may be brought down to the middle of the eighteenth century, the fact of the extensive succession of rocks, and their continuity across our island, does not appear to have been suspected. The philosophers of preceding times furnish, in their writings, few hints that they entertained any but the most vague notions of the distribution and relative position of those formations which occasionally attracted their attention.

There wanted not individual collectors of such remarkable productions as accident brought to view; nor was there any lack of theorists to devise ingenious systems, from these isolated data, by which to account, in their estimation, not only for the phenomena immediately before them, but for the formation, destruction, and subsequent renovation of the entire globe. It is foreign to the purpose of this article to refer more particularly to these speculations; no benefit would accrue from the narrative, beyond the historical developement of a science which had the usual share of ignorance, prejudice, and obscurity to impede its infant progress.*

* The following are the writers whose opinions have obtained the greatest celebrity, as advocates for particular systems accounting for the formation and subsequent alteration of the earth: —

Mr. Whitehurst taught that the *concentric arrangement* of the crust of the globe was destroyed by the expansive force of subterranean fire.

Burnet's theory supposes this crust to have been broken for the production of the deluge.

Leibnitz and *Buffon* believed the earth to have been liquefied by fire; in fact, that it is an extinguished sun or vitrified globe, whose surface has been operated upon by a deluge. The latter assumes that the earth was

There were men, even long prior to the time of which we speak, who appear to have had some glimpses of geological truth. One of these, George Owen, of Pembrokeshire, before the close of the sixteenth century, in describing the coal district of South Wales, shows that he was aware that the mineral masses were not confusedly assembled within its area, but extended in a certain uniform arrangement. The striking features presented by a coal field like that of South Wales, and the observation necessarily exercised in tracing the direction of its principal mineral beds, for practical purposes, probably led to an examination of the whole. It is in such situations, and under such circumstances, that the earliest geological investigations would originate. The facts, however, which resulted from this survey, were unavailing to the interests of the science, as his manuscript remained unpublished until a few years ago.

About the commencement of the eighteenth century, some geological descriptions of portions of Bedfordshire, Kent, and Somersetshire, appeared in the *Philosophical Transactions*. These are to be regarded rather as rough sketches of unconnected districts, than as parts of a systematic well defined arrangement. It was a point then undecided, "whether the stones we find in the form of shellfish be *lapides sui generis*, naturally produced by *some extraordinary plastic virtue*, latent in the earth, in quarries where they are found, or whether they rather owe their form and figure to the shells of the fishes they represent." (*Dr. Plot*, in 1677.)

In favour of the former of these alternatives, appear the names of Plot, Ray, Lister, and other eminent naturalists, and it obtained advocates as late as the year 1752, the fossil re-

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75,000 years in cooling to its present temperature, and that, in 98,000 years more, productive nature must be finally extinguished.

Woodward considered there was a temporary dissolution of the elements of the globe, during which period the extraneous fossils became incorporated with the general mass.

De Luc, *Dolomieu*, and, finally, *Baron Cuvier*, unite in the opinion, that the phenomena exhibited by the earth, particularly the alternate deposits of terrestrial and marine productions, can only be satisfactorily accounted for by a series of revolutions similar to the deluge.

Among the singular views entertained by men of genius, in the infancy of the science, are those of *Whiston*, "who fancied that the earth was created from the atmosphere of one comet, and deluged by the tail of another;" and that, for their sins, the antediluvian population were drowned; "except the fishes, whose passions were less violent."

A French geologist conceived that the sea covered the earth for a vast period; that all animals were originally inhabitants of the water; that their habits gradually changed on the retiring of the waves, and "that man himself began his career as a fish!"

mains being still strenuously asserted to be nothing more than links in the progressive series by which unorganised matter is connected with the animal world.

Both the naturalists, Llwydd and Lister, seemed to have noticed that certain of these fossil shells were peculiar to, and afforded the means of distinguishing, certain rocks. They did not pursue their observations sufficiently far to apply this discovery extensively in classing the strata, but they are entitled to the merit of having recognised the principle. To the latter naturalist is also due the credit of suggesting, in 1684, the construction of maps, to denote, by colours, the superficial extent and boundaries of soils, clays, rocks, and mineral strata; for, as he sagaciously observes, "*we shall be better able to judge of the make of the earth*, and of the many phenomena belonging thereto, *when we shall have well and duly examined it*, as far as human art can possibly reach, beginning from the outside, downwards."

Towards the middle of the eighteenth century, and extending to the nineteenth, correct and enlarged views began to be entertained: on the Continent, as to the constancy in the position of fossil shells, in peculiar beds, and as to the distinctions between the primary and secondary rocks; in England, as to the predominant characters of our most remarkable strata, their identity and continuity. In the list of foreign contributors, during this period, occur the names of Guettard, Lehman, Rouelle, Buffon, Werner, Saussure, and Pallas; in the English, we record those of Mitchell, Whitehurst, Hutton, and Playfair.

We now approach an important epoch in the history of this science in England. The appearance of the first geological map, by Mr. William Smith, in the year 1815, after twenty-five years of unremitting application to the project, is an event of some moment. On the merit of this great performance, it is not practicable to enlarge here. Suffice it to quote the deserved encomium of a philosopher of another country, M. D'Aubuisson. "That which the most distinguished mineralogists have done in a small part of Germany, in half a century, a single individual has undertaken and effected for the whole of England: and his work, as beautiful for its result as it is astonishing for its detail, has led to the conclusion, that England is regularly divided into beds; that the order of their position is never inverted; and that precisely similar fossils are found in all parts of the same bed, and at remote distances."

A few years prior to this event, the number of enquirers into this interesting science had considerably augmented. Numerous individuals, highly qualified for the employment, had entered with all the ardour inseparable from this pursuit, into various departments of research. Information was as freely diffused as circumstances would permit; and that tenacious adherence to favourite dogmas, which characterised an earlier period, gradually relaxed as men applied themselves to the preliminary acquisition of knowledge, to the rigorous examination of facts on an extended scale, and the consequent developement of irresistible truths.

The advantages, and indeed the necessity, of cooperation, in such an immense field of investigation, became more and more apparent. Hitherto the discoveries and opinions of individuals were imperfectly known or understood; their opportunities of personal communication, of collision of sentiment, and of referring to authentic illustrations of British and foreign geology, were unfrequent. They were as yet not far removed from the time, "when the vague and cursory information that every man might glean from the objects that were perpetually before him, when combined and magnified by a powerful imagination, was sufficient for all the purposes of geological speculation. According to this view of the matter, a man might philosophise very well by himself; it was his business not to discover, but to invent; and he stood no more in need of the assistance of others, than if he had been at work in the regions of poetry or romance." Under these disadvantages, it is not surprising that the progress of this branch of knowledge had been extremely slow. Such a state of things was obviously unfavourable for concentrating geological data and eliciting important results; for ascertaining characteristic features, and describing them with precision, and for establishing an appropriate nomenclature. To facilitate these desirable objects, it was necessary to combine the exertions of those who were engaged in a common pursuit, and its advocates soon became sensible of the impulse it had received from the union of labour.

In the year 1807, most of the English geologists formed themselves into a society, which rapidly increased, and whose members have zealously and successfully employed themselves in researches into the geology, not of this country alone, but by degrees of almost every portion of the globe. It is scarcely necessary to add that which is understood and conceded by all geologists of our times, that they have less to do with speculations on the earth's formation, than with the acquisition of that evidence, by means of which it is alone probable a clue will be discovered to those parts of the system that are as yet inexplicable; acting upon the principle with reference to that ultimate object, that, "*before attempting an explanation, it is best to be acquainted with the thing to be explained.*"

In looking at the mass of valuable information contained in the *Transactions of the Geological Society*, at the many other illustrative works, of high estimation, which have appeared during the last ten or twenty years, and at the space which this science now occupies in our leading periodicals, we perceive proofs of the increasing number of observers, the immense variety of the objects under consideration, the skill which has been exercised in their developement, and the emulation excited to explore the vast series which yet remain. In the midst of apparent confusion there arises abundant evidence to show that order prevails, and that certain rules and principles have every where influenced the distribution of the phenomena we are attempting to investigate. This observation is not new, neither is the result wholly unexpected.

Eighteen years ago it was said, "if the face of the earth were divided into districts, and accurately described, we have no doubt that, from the comparison of these descriptions, the true theory of the earth would spontaneously emerge without any effort of genius or invention. It would appear as an incontrovertible principle, about which, all men, the moment that the facts were stated to them, must of necessity agree. Instead of a hundred different theories, about which they dispute with never ending sophistry, there would be a few general maxims, in which all men of sense and information would uniformly acquiesce." The period anticipated by the reviewer is still, probably, very remote. So vast an era presents an almost inexhaustible field to occupy the researches of geologists yet to come. We possess at best but the rudiments of geological surveys of the principal portion of Europe. In France and Germany, the examination has been limited to particular spots, while large districts have been almost overlooked. Of all countries Great Britain has been most minutely investigated, and its ablest naturalists, having accomplished so much at home, are widely extending their researches to remote countries.

It would be invidious, even were it compatible with the plan of the present essay, to particularise the contributions to this department of natural science, in England, since the publication of the first geological map. A second map, nearly of the size of Mr. Smith's, made its appearance shortly after, chiefly through the exertions of Mr. Greenough; and some valuable corrections and additional details, contributed by that gentleman and by contemporary geologists, were therein introduced. The adaptation of the colours which distinguish the strata, and define their boundaries with great precision, exhibits much judgment, and is not the least of its improvements. This map has been since engraved upon a reduced scale, with the advantage of possessing most of the principal observations made during the last ten or twelve years; and, notwithstanding some obvious minor defects, as a guide to the scientific English traveller, cannot be too highly commended.

Mr. Farey completed an elaborate mineralogical survey of Derbyshire, and was long an active contributor, through various channels, towards the promotion of a science to which he was zealously attached.

It were injustice to the memory of Mr. Parkinson to pass unnoticed his *Organic Remains of a former World*, which appeared in 1808; the earliest (except the *Fossilia Hantoniensia* of Solander and Brander), the most elaborate, and certainly the most magnificent, work that issued from the British press, in illustration of a department of natural history then little understood. This, and a subsequent *Introduction to the Study of Organic Remains*, have placed their author in the first class of naturalists. But English geology at that period was quite in its infancy. Little was known of distinctions in strata; and, as the fossils were classed without regard to geological arrangement, the utility of the work was considerably lessened. Of this imperfection the author appears to have been aware in his preface to the concluding volume.

The unavoidable deficiencies here alluded to have been, in a great measure, supplied by Mr. Sowerby's *Mineral Conchology of Great Britain.* The first portion of the work had also the disadvantage of appearing before the nomenclature and true position of the formations were determined; a circumstance which has disturbed the uniformity of the plan, but which a carefully compiled general index, or rather a good series of indexes, will materially rectify. This unrivalled production, commenced in 1812, and continued to the present time, does honour to the name of this distinguished naturalist and his sons, and will long remain among the most useful, as it is one of the most splendid, acquisitions to the science it so beautifully illustrates.

Mr. Bakewell published a useful *Introduction to Geology* in 1813, the third edition of which has been recently printed, comprising much valuable additional matter. The views of this gentleman on some points relating to the arrangement of rocks, and their analogies to Continental formations, differ somewhat from those currently adopted by English geologists, but demand all the respect to which so experienced an authority is entitled.

In the same year, 1813, appeared a translation of Baron Cuvier's *Essay on the Theory of the Earth*, with notes, by Professor Jameson. This work, so deservedly celebrated, which has contributed so much to extend the taste in this country for such pursuits, reached its fifth edition in 1827. Few scientific essays have been studied with such interest as this; and so strongly do the sentiments impress themselves on the memory of the reader, that it would be difficult to point out a modern geological writer who has not unconsciously adopted some expressions of its eloquent author.

About the same time some highly interesting discoveries were made, by Mr. Webster, in the Isle of Wight and on the southern coast of England, which established some remarkable facts relative to the vertical strata in that quarter, and the coincidence between the fresh-water formations in the basin of Paris and those, previously unknown, in the Isle of Wight. To the talents of this gentleman, both as an artist and an accurate observer, science is under great obligations.

For elucidations of the natural history of those obscure tribes, the Encrinites, the Belemnites, and other animals allied to them, we are indebted to the labours of Mr. Miller.

Messrs. Coneybeare and Phillips, authors of *Outlines of the Geology of England and Wales*, have, in that useful treatise, made us acquainted, in detail, with the entire series of deposits from the tertiary to the carboniferous class. The introductory compendium of the general principles of geology is the best of its kind; and we may be excused, if, during the progress of the following pages, we occasionally draw our information from a source so authentic. In a field so extensive and so newly explored, it would be remarkable, indeed, if some omissions, some unintentional inaccuracies, were not occasionally discoverable; yet such is the value which we, in common with other practical enquirers, attach to these *Outlines*, that we cannot but regard the period of their appearance as an epoch in the progress of the science. It only remains for us to express the hope that the second volume, so long delayed, will ere long make its appearance.

Many occasional writers, particularly the contributors to the *Transactions* of the Geological Societies of London, Edinburgh, and Cornwall, the Royal Societies of London and Edinburgh, the Wernerian Society, and the Cambridge Philosophical Society, have elucidated various portions of our mineral and mountain districts, or have exhibited much sagacity in unravelling the zoological labyrinth of a former world.

The geological professors at Oxford and Cambridge have each largely and liberally contributed to our knowledge of the structure of our island; and the names of Buckland and Sedgewick have long been classed with the profoundest investigators of our times.

In the department of comparative anatomy, interesting results have attended the researches of Dr. Buckland, Mr. Clift, Mr. Pentland, Mr. Mantell, Sir Everard Home, and Mr. Coneybeare.* The volcanic phenomena have been ably illustrated by Mr. Scrope and Dr. Daubeny.

There is some difficulty in determining where to pause. Were we to enumerate all those who have assisted in the advancement of English geology, the list would extend further than is compatible with the plan of our sketch; but the names of several of these authorities will occur as we proceed.

While the naturalists of Great Britain were rewarded by so many interesting discoveries, others, not less important, resulted from the researches of their foreign contemporaries, Cuvier, Humboldt, Brongniart, Lamarck, and other scientific men in France, Italy, Germany, and in more remote parts of the earth.

The examinations of our own countrymen have likewise been widely extended, and there are few parts of the world which have not been subjected, more or less, to the inspection of British geologists. For improving our knowledge of the structure of Southern and Western Europe we are indebted to Dr. Buckland, Mr. Bakewell, Mr. Scrope, Dr. Daubeny, Sir A. Crichton, Dr. Fitton, Mr. Coneybeare, Dr. Trail, and Mr. De la Beche; of Russia, to Mr. Strangeways; of Hungary, to Dr. Bright; of Jamaica, to Mr. De la Beche and Mr. Bennett; of Antigua, to Dr. Nugent; of Ceylon, to Dr. Davy; of the Straits of Magellan, to Captain King; of Rio de Janeiro, to Mr. Caldcleugh; the southern and western parts of the Canadas, to Dr. Bigsby; and the coast of Labrador, to the Rev. Mr. Steinhauer; the northern coasts of America, to Captain Franklin and Dr. Richardson; and of some portion of the Arctic regions, to the scientific gentlemen attached to the expedition commanded by Captain Parry.

In India geological investigations have been pursued by Mr. Colebrooke, Mr. Fraser, Messrs. S. and B. Babington, Dr. Adam, and Mr. Craufurd; and the latter gentleman has recently brought a magnificent collection of fossil animal remains from Ava. Captain James Franklin has illustrated the geology of a portion of Central India by a map and memoir.

* Mr. Weaver has described the fossil elk of Ireland; and Mr. König, of the British Museum, has commenced a work on fossils, under the title of *Icones Fossilium Sectiles*.

The science is also indebted to the researches of Dr. Skey in Barbadoes, of Dr. Nugent in the Isles of Trinidad and Montserrat, of Captain Veitch in the Island of Bermuda, and Dr. Jack in Sumatra.

With regard to the history of geological discovery, much valuable information is comprised in a series of masterly articles in the *Edinburgh Review*, commencing in 1811, and continued, at intervals, to a late period. In the *Quarterly Review* also, and in several of the scientific journals, geological communications of high character and value have occasionally appeared. Nor ought we to omit to notice, in this place, the able address delivered by Dr. Fitton, President of the Geological Society, at the Annual Meeting of the Fellows, February 15. 1828.

When we consider the short time that geology has been pursued as a science of induction, the enormous area submitted to examination, and the prodigious mass of unquestionable facts which have been established, we cannot but exult at the progress which has been made, and at the elevated station it now holds.

While new discoveries are daily occurring, while doubtful points are from time to time receiving elucidation, and many desiderata continue to be supplied, the time is perhaps still remote when it may be asserted that the work of English geologists is done, and their acquaintance with the structure even of their own country is complete. Even now we are familiar with little more than the most prominent features of some formations. The subordinate details remain to be filled up, and will afford scope for the investigations of an increasing class of observers. In almost all our great provincial towns, institutions have been established within a very short period, having, amongst other objects, those of facilitating the study of local geology, and forming illustrative collections of mineralogical and fossil substances. To most of these associations lectureships are attached; and museums of natural history, mineralogy, and comparative anatomy are founded, and rapidly augment. Thus the advantages which at first exclusively appertained to the parent institutions of the metropolis, are placed within the reach of a very extensive class of society. The time may be distant ere these local museums will rival the noble collections in some Continental universities; but, originating in the improved state of society, they are supported with energy. The foundations are laid; the nuclei are formed, around which are rapidly concentrating vast masses of matter, available to the interests of science, to an extent we are scarcely able to appreciate.

(*To be continued.*)

Art. XI. *On the Modification of Clouds called Wind Reels.* By J. Rennie, A. M.

The names which have been given to different species of clouds by Mr. Luke Howard, are now pretty generally known and adopted in meteorological journals; but, though the author (naturally enough, no doubt) deprecates the attempts which have been made to substitute English terms for his Latin ones, there can be little question that his learned nomenclature has retarded the popularity of the science. If this be the fact, as it, indeed, appears to be, it will be preferable to adopt such English terms as may be more intelligible to the general reader.

The species of cloud, therefore, which is called Cirrus by Mr. Howard, may be conveniently termed the *wane-cloud*, being the thinnest, lightest, and highest of all the clouds: as if the accumulated vapour which composes the lower and denser clouds had *waned* away, by its distance and elevation. The different forms which the wane-cloud assumes, in consequence of atmospheric changes, may be equally designated by English as by Latin terms. The modification which falls to be noticed at present, is called, by the peasants in Kent, *wind-reels*, from the notion that the streaks lie in the direction of the wind. That the current of the wind may have some influence in the arrangement of those streaks of wane-cloud, is not improbable: but that some portions of the cloud are not influenced by the wind, is proved by the streaks which may often be observed to cross the main lines at various angles; in some instances, indeed, so regularly, as to make a part of the sky look like network.

A very beautiful instance of the wind reel fell under my observation, on the 20th of May, 1828. The wind was N. W., light, warm, and there had been a succession of dry weather for many days, a circumstance which is popularly supposed to influence the formation of such clouds; with some justice, perhaps, as they seem to be frequently the forerunners of rain; the first nucleus, as it were, of the gathering rain-cloud. One of the streaks spanned the entire visible horizon, from N. W. to S. E., in an uninterrupted and nearly uniform arch, about the usual dimensions of a rainbow, though not so well defined, as I have endeavoured to represent in the following sketch. (*fig.* 198.) This arched cloud was accompanied by others, conterminous with it, and nearly parallel with respect to the direction of their component streaks. These appeared to verge to a point; but this was, probably, a common optical deception, depending on the laws of perspective; at least, this is the received opinion of meteorologists respecting arched clouds. I am disposed, however, to think that the phenomenon cannot be always referred to optical deception; for I have, more than once, observed arched clouds in various positions and direc-

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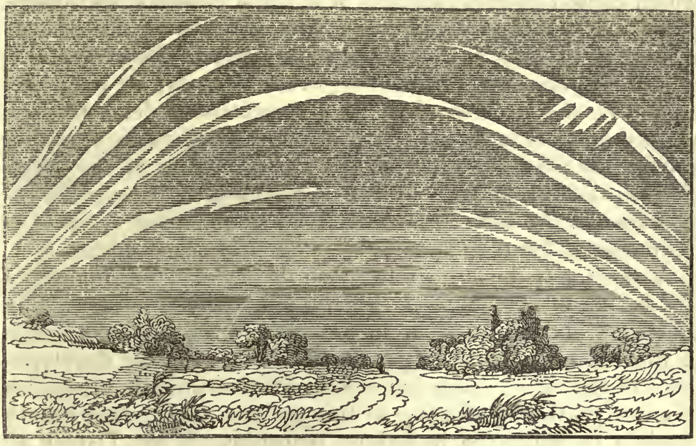

tions, with regard to the eye, which they could not have appeared in according to this supposition.

I continued to observe and admire those arched lines of cloud for several hours, namely, from noon till between four and five in the evening; and, what was remarkable, though there was a light but steady breeze of wind in the direction of the arched lines, the form of the cloud remained nearly stationary, and uniform in its outline. Now, are we to infer from this, that a thin light stream of vapour, spread over the whole extent of the horizon, and acted upon, for four or five hours, by a breeze of wind, would neither be evaporated nor moved from its position? The affirmative would be the natural inference; but Mr. Daniell, in his excellent *Essays on Meteorology*, has endeavoured to account for the apparent stationary phenomena of clouds, in so very ingenious and satisfactory a manner, that I hesitate not to adopt his explanation.

"The apparent permanency," says Mr. Daniell, "and stationary aspect of a cloud, is often an optical deception, arising from the solution of moisture on one side of a given point, as it is precipitated on the other. No phenomenon is more common amongst mountains, or upon hills by the sea-side, than clouds upon the summits, which appear to be perfectly immovable, although a strong wind is blowing upon them at the time. That this should be the real state of the case, is clearly impossible, as so attenuated a body as constitutes the substances of the clouds must obey the impulse of the air.

The real fact is, that the vapour which is wafted by the wind, is precipitated by the cold contact of the mountain, and is urged forward on its course till, borne beyond the influence which caused its condensation, it is again exhaled, and disappears. A slight inspection and consideration of the phenomena will be sufficient to convince any one of the correctness of this explanation. Reasoning from analogy, we may conclude that the process which thus proceeds, under our eyes, upon the summits of the hills, likewise takes place on either side of the planes of precipitation in the heights of the atmosphere; the vapour is continually condensed, as continually redissolved in the act of precipitation, and the cloud appears to be unchanged and stationary." (Page 124., first edition.)

According to the electro-chemical theory of the formation of clouds, however, it would be affirmed that the cloud was really stationary and unchanged, in consequence of the equilibrium of the electrical influence produced by the primary developement of the cloud, from the union of the constituent principles of water previously existing in the gaseous state. It is barely possible to apply the ingenious reasoning of Mr. Daniell to this theory, and to suppose that, while the mist or vapour constituting the cloud is forming upon one side, the water is simultaneously decomposed on the other side.

We are still too much in the dark, with respect to the principles that regulate atmospherical phenomena, to decide upon the precise effects of electricity; but, supposing the theory alluded to has some foundation in nature, we may be tempted to proceed a step farther, and connect it with the nearly allied influence of magnetism. Indeed, without some such power acting upon the light and movable streaks and tufts of vapour which form what I call wane-clouds (*Cirrus*, Howard), I cannot devise any satisfactory explanation of the appearances which may so frequently be observed; for, if the wind were the sole agent in determining their forms and positions, they ought always to stream in the direction of its current, as we see is uniformly the case in the analogous instance of smoke. In the case of wane-clouds, however, they as frequently appear to cross, or lie obliquely to the current of the wind which blows in the plane of their stratification, as the contrary; and, sometimes, they may be seen in positions simultaneously so dissimilar, that it seems difficult to refer the direction of any particular tuft or streak to any known agent. As an instance of this, I sketched the following (*fig.* 199.), a few days after the occurrence of the preceding arched wane-cloud. The wind, it is true, was easterly in the general direction of the streaks; but besides the shorter crossing streaks at *a* (*fig.* 198), which were almost at right angles to the current of the wind, there were long streams extending over half the visible horizon, divaricating very considerably from the parallelism of the line which marked the direction of the wind. Might it not be that some, at least, if not all, of the lines of cloud were in a position corresponding with what mathematicians call the *resultant* of

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two forces, which, in this case, I assume to be the current of the wind and terrestrial magnetism? So far, at least, I am certain that those long lines of wane-cloud very frequently lie in directions corresponding, or nearly corresponding, with the magnetic meridian; and, if magnetism has no influence over them, the coincidence must be confessed to be singular and unaccountable.

It would be wrong, however, to venture upon any positive assertion of this theory, or rather speculation, in the deficiency of well-ascertained facts; but, from the analogous arrangement between the wane-clouds figured above, and the streaks of the aurora borealis, which is also supposed to be connected with magnetism or electricity, I think that farther investigation may elucidate the dependence of the phenomena on the same causes. The aurora borealis, indeed, is almost always in the direction of the magnetic meridian, while the wane-clouds in question, so far as I have remarked, are more under the influence of the current of wind blowing in the plane of their stratification.

Lee, Kent, June 2.

Art. XII. *On Water-Spouts.*

Water-spouts make their appearance from the bosom of a heavy cloud, such as that represented at (*fig.* 200. a), gradually descending in a point like an inverted cone, sometimes perpendicularly, and sometimes bending, or waved. The weight and velocity of such a body of water falling into the

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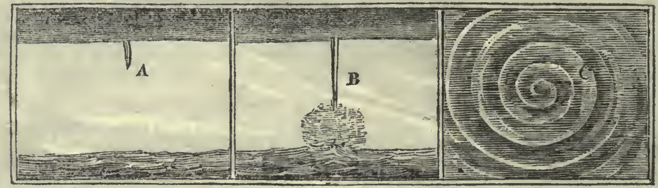

sea, agitate and throw up the water around in a surprising manner, as represented at b, till it is exhausted, when it disappears gradually as it began. It is obvious that the phenomenon is caused by a change in the atmosphere when full of clouds, by different contrary currents of air opposing one another, perhaps in the same manner as may be seen in streams of water, which, by the intervention of some body are variously thrown into whirlpools, which by their circular motion carry down a conical column of air in their centres.

In this manner we may suppose, that when the atmosphere is surcharged with gross and heavy vapours, put into violent motion by the impulse of contending winds, one of which must prove the most powerful, they may force one another into a circular or spiral motion, as at figure c, to the centre of which the grossest and heaviest parts inclining, as is the case in all fluid bodies, form into a body which we see descend. The body is of various sizes; one seen at about a mile distant appeared to be about 5 ft. in diameter; but there are some seen much larger. It cannot be ascertained from their appearance, whether they are solid or hollow in the centre.

PART II.

REVIEWS.

Art. I. *Illustrations of British Entomology; or, a Synopsis of Indigenous Insects, containing their Generic and Specific Distinctions; with an Account of their Metamorphoses, Times of Appearance, Localities, Food, and Economy, as far as practicable.* By James Francis Stephens, F.L.S., Member of the Zoological Society, &c. Embellished with coloured Figures of the rarer and more interesting Species. 8vo. Vol. I. *Mandibulata,* pp. 186. Vol. II. *Haustellata,* pp. 150. London, Baldwin and Cradock, 1828.

With the exception of botany, perhaps, there is no branch of natural history so fascinating as the study of insects, particularly to the young; that is, if the bias of opening curiosity be properly directed. It is the common every-day practice in most families, to teach children, from the earliest infancy, to treat the greater number of insects as if they were serpents, venomous and dangerous, and of course meriting to be destroyed, or at least avoided with horror, wherever they are met with. Associations are by this means linked with the very appearance of insects, which become gradually more inveterate with advancing years, provided, as most frequently happens, the same system be persisted in of avoiding or destroying almost every insect which is unlucky enough to attract observation. How much rational amusement and innocent pleasure are thus thoughtlessly lost, and how many disagreeable feelings created in the most absurd and foolish manner, we shall be fully able, we hope, to show as we proceed.

To prove that the study, or (if the word be disliked) the observation, of insects is peculiarly fascinating to children, even in their years of infancy, we may refer to what we have seen in the family of a friend, who is partial to this, as well as to all the departments of natural history. Our friend's children, a boy and a girl, were taught from the moment they could distinguish insects, to treat them as objects of interest and curiosity, and not to be afraid even of those which wore the most repulsive appearance. The little girl, for example, when just beginning to walk alone, encountered one day a large

Staphylìnus, which she fearlessly seized, and did not quit her hold, though the insect grasped one of her fingers in his formidable jaws. The mother, who was by, knew enough of the insect to be rather alarmed for the consequences, though she prudently concealed her feelings from the child. She did well; for the insect was not strong enough to break the skin, and the child took no notice of his attempts to bite her finger. A whole series of disagreeable associations with this formidable-looking family of insects was in this manner averted, at the very moment when a different mode of acting on the part of the mother would have produced the first link of the chain. For more than two years after this occurrence, this little girl and her brother assisted in adding numerous specimens of insects to their father's collection, without the parents ever having had cause, from any accident, to repent of their employing themselves in this manner. The sequel of the little girl's history strikingly illustrates the position for which we contend. Family embarrassments rendered it expedient for the child to be sent to a relative in the country, where she was not long of having carefully instilled into her mind all the usual antipathies against "every thing that creepeth upon the earth;" and though she afterwards returned to her paternal home, no persuasion nor remonstrance could ever again persuade her to touch a common beetle, much less a Staphylìnus, with its tail turned up in a threatening attitude, and its formidable jaws ready for attack or defence.

But while we contend for the advantages in point of pleasure alone, though science be left out of our consideration, we would not be understood as carrying the matter to extremes. Our meaning is, that while children are taught to look upon all insects as objects of interesting observation, they ought, at the same time, to be carefully warned of those which may do them injury, such as bees, wasps, and ants, and among the beetles, the male stag-beetle (*L*ucànus cérvus), whose bite, or rather pinch, is not a little painful. Nothing, however, can be more absurd, than the fear universally entertained in England of the larger sorts of dragon-flies (Libellulìdæ), which are branded with the erroneous name of *horse-stingers*, though the most superficial examination will demonstrate that these insects have not a shadow of a sting: but their jaws are large and strong; not stronger, however, than those of the Staphylìnus above mentioned, and of course not dangerous in the slightest degree, even to infants.

Holding these views to be important, in reference to early education and to the multiplying of the pleasures of youth, manhood, and old age, we cannot but cordially hail the publication of every work which is calculated to extend them, by pointing out subjects of observation, and thus leading the inquisitive and the curious from the known to the unknown in the productions of nature. Mr. Stephens's book is eminently calculated to effect that purpose in many respects, though its extensive plan, and the elegant manner in which it is got up, render it by necessity too expensive for very general circulation. In the two volumes now before us, the author has furnished us with the best (in numerous instances with the only) account which has hitherto been given of our native insects, and as he has not copied his descriptions from books, but given the result of his personal observations upon the specimens in his own rich, if not unrivalled, cabinet, the confidence of the student in the author's accuracy is thereby strongly corroborated.

The author follows the two leading divisions of insects proposed by Clairville, namely *Mandibulàta*, comprehending insects furnished with mandibles, or jaws; and *Haustellàta*, comprehending insects furnished with haustella, or suckers. These he divides into orders, and subdivides into sections, sub-sections, families, genera, species, and varieties. As his orders are somewhat different from those hitherto proposed, and withal more distinctly characterised, we shall take the liberty of giving in English what the author has put down in Latin in his tabular sketches. It may be remarked that he is an advocate for the circular system of Macleay, though he does not follow his quinary divisions; the septenary (as he appears to think) being more suited to his orders. The following numbers, therefore, are supposed to return reciprocally into one another.

I. MANDIBULÀTA (with jaws).

2. *Strepsíptera.* — The upper wings more or less coriaceous; the under wings contorted; as in Xènos.

3. *Coleóptera.* — The upper wings more or less coriaceous; the under wings not contorted, but transversely plicatile; the nervures simple; as in Cárabus, the garden beetle.

4. *Dermáptera.* — The upper wings more or less coriaceous; the under wings not contorted, but transversely plicatile; the nervures radiated; as in Forfícula, the earwig.

5. *Orthóptera.* — The upper wings more or less coriaceous; the under wings not contorted, but longitudinally plicate; as in Blátta, the cockroach.

6. *Neuróptera.* — All the wings membranaceous and reticulate; as in Libéllula, the dragon-fly.

7. *Trichóptera.* — All the wings membranaceous, venose, and hairy; as in Phrygànea.

8. *Hymenóptera.* — All the wings membranaceous, venose, and naked; as in *V*éspa, the wasp.

II. Haustella`ta (with a sucker).

13. *Hemíptera.* — Wings four, not scaly; body depressed; as in *C*ìmex, the plant-bug.

14. *Homóptera.* — Wings four, not scaly; body elevated; as in A`phis, the plant-louse.

8. *Lepidóptera.* — Wings four; scales imbricated; as in *P*apílio, the butterfly, and Sphínx, the hawk-moth.

9. *Díptera.* — Wings two; head distinct; as in *M*úsca, the fly.

10. *Homalóptera.* — Wings two; head sessile; as in Hippobósca, the forest-fly.

11. *Aphaníptera.* — Wings none; body compressed; as in *P*ùlex, the common flea.

12. *A'ptera.*—Wings none; body depressed; as in Lepísma, and *P*edículus, the louse.

This sketch, slight as it is, will enable our readers, with a very little attention, to class any insect with which they happen to meet; but for ample, clear and scientific descriptions of the genera, species, and varieties, recourse must be had to the work itself. It is but justice, however, to Mr. Stephens to add, that he has by no means limited himself to a mere description of insects. He has in many cases entered minutely into their economy, and into details connected with utility. Speaking, for example, of the larvæ of the Adéphaga of Clairville, a section of the order Coleóptera, he says: —

"They voraciously devour worms and the larvæ of all other insects, as well as perfect insects; though the larvæ of Zàbrus gíbbus are said to destroy young wheat, and a long account of their devastations, in the canton of Seeburg, near Halle, in Germany, is given in the first volume of Germar's *Magazine der Entomologie*, wherein it is stated, that they were accompanied with a large proportion of the herbivorous larvæ of *M*elolóntha ruficórnis. May not," Mr. Stephens adds in a note, "these herbivorous larvæ have been the principal cause of the mischief to the wheat, while those of the Zàbrus contributed rather to lessen their numbers than to destroy the corn." (vol. i. p. 4.)

"And is it not probable that the perfect insects ascend the corn for the purpose of devouring the parasite insects thereon? This is a subject that requires investigation, as it is highly important for the interests of the agriculturists, in those districts where the insect abounds (as at Worthing, Brighton, Hastings, Cambridge), that the question should be thoroughly set at rest; because, should the Zàbri depart from the habits of the group to which they belong, and become herbivorous instead of carnivorous, their destruction would be desirable; while, on the contrary, if they destroy the devourers of our produce, their preservation should be attempted." (vol. i. p. 140.)

Did our space permit, we could multiply extracts of similar interest, though the merit of the work does not depend so much on details of this kind, as on its profound, minute, and accurate science, in which department Mr. Stephens could not be easily surpassed. We cannot but heartily wish all success to a work so eminently deserving the patronage of the British public. J. R.

Art. II. *Conversations on Geology: comprising a Familiar Explanation of the Huttonian and Wernerian Systems; the Mosaic Geology as explained by Mr. Granville Penn; the late Discoveries of Professor Buckland, Humboldt, Dr. Macculloch, and others.* 1 vol. 12mo, with coloured engravings and wood-cuts, pp. 371. Maunder, London, 1828.

We have no wish to retract the very favourable opinion which we expressed of this work, when it was first put into our hands (see p. 280.); but, in order to put it in the power of our readers to judge for themselves, we shall now give some account of its plan and execution.

The author, as will appear from the title, has rejected (we think, wisely) the obsolescent catechetical method formerly so fashionable, and has in some measure followed the classical models of Xenophon, Plato, and Cicero. This, it has been observed by a contemporary reviewer, as a method of exciting interest and affording room for apt illustrations, is immeasurably beyond the clumsy, dry, and lifeless plan too frequently followed, of question and answer, inasmuch as it carries with it the thread of a narrative, which the question and answer system is perpetually snapping asunder. According to the latter plan, we might expect, in a Catechism of Geology, some such beginning as the following: —

Ques. — What is meant by geology?

Ans. — By geology is meant the science of the earth's formation and changes.

Ques. — Of how many parts does the science of geology consist?

Answ. — The science of geology consists of four parts.

&c. &c. &c.

Now, as a contrast to this, let us see how the subject is managed in the conversational style, by the author under review. We quote from the opening of the first conversation, premising that the speakers are Mrs. R. and her two children, Edward and Christina, each of whom is characterised by peculiarities of sentiment and style of thinking.

" *Edward.* — Sea-shells, did you say, mother, in the heart of solid rocks, and far inland? There must surely be some mistake in this; at least it appears to me to be incredible.

" *Mrs. R.* — Incredible as you suppose it to be, my dear boy, you may see it with your own eyes in the marble of this chimney-piece, which you may perceive is throughout studded with shells, as if they were fresh from the sea. They even retain, as you perceive, their original *nacre*, as the French call the peculiar lustre of mother-of-pearl.

" *Christina.* — Ah, so they do; but, I dare say, it is only a good imitation of shells made on the marble. There is a very pretty one on the lid of my work-box, which is certainly artificial; and those in the marble may have been done in the same way.

" *Mrs. R.* — But, my dear, there is no *nacre* on the shell on your work-box; and it is evident, indeed, that it is wholly made of pieces of stained wood, ingeniously put together: but the shells in the marble are real shells, as you may see, differing in nothing from those we find on the sea-shore.

" *Edward.* — Then how could they come into the marble? It must have been soft, like paste, or have been precipitated or deposited, as we say in chemistry, over the shells; for they are distributed, as I perceive, through its substance.

" *Mrs. R.* — Yes; and if you were to break the marble into a thousand fragments, you would find a shell in almost every one of them.

" *Christina.* — Is there any history of these curious shells, mother? I should like above all things to read it. I suppose it must be something like the stories I have seen of living toads found in the heart of growing trees.

" *Mrs. R.* — The history of the shells, my dear, and many other things no less wonderful, is given in the science called Geology, which treats of the first appearance of rocks, mountains, vallies, lakes, and rivers, and the changes they have undergone from the creation and the deluge till the present time." (p. 3.)

As a considerable portion of the volume is devoted to the two rival theories of the earth, proposed by Hutton and by Werner, whose several disciples have been named *Vulcanists* and *Neptunists*, because the former advocates the agency of fire, and the latter the agency of water, in the formation of the crust of the earth, we shall give a short sketch of the leading doctrines of both systems, nearly in the words of our author: —

' For the purpose of making a globe like the earth, with seas, continents, and islands, diversified with hills and vallies, and productive of food for various animals, Dr. Hutton considered it as indispensable that other globes should have previously existed, from which materials for the structure might be derived. These supposititious worlds being acted on by the moist atmosphere, by rains, and by the frosts and thaws of winter and spring, would, in a long course of years, be crumbled down, or, as the geologists say, disintegrated, and gradually carried by rivers, in the form of sand, clay, and gravel, to the sea. At the bottom of the sea these materials would arrange themselves in beds, differing in thickness, according to the circumstances by which they might be affected. But those beds would have continued in the soft state of sand or clay for ever, unless something occurred to harden them. It is here that Dr. Hutton brings in the agency of fire, and tells us, that there is at the bottom of the sea sufficient heat, from a great central fire which he conceives to exist in the centre of the globe, to melt all the clay, sand, and gravel, and to form them into rocks. He provides for the appearance of these above water, by supposing that the central fire occasionally expands itself, and elevates the newly formed rocks into islands and continents, diversified by hills and vallies; these being destined in their turn to the same changes of destruction and renovation, as those from which they took their origin.' (p. 47—50.)

'According to the rival geological theorist, Werner, all the substances which now constitute rocks, mountains, and soil on the earth's surface, were originally existing, in a state of solution, in the waters of the great chaos, which he supposes at the beginning to have surrounded the globe to a vast depth. The substances or materials of rocks, thus swimming in the primitive ocean, he conceives to have gradually fallen to the bottom, sometimes by chemical, sometimes by mechanical means, and sometimes by both together; and in this manner, he thinks, all the rocks have been formed which we now find on digging into the earth. The inequalities of mountains and vallies on the surface of the earth, which were thus produced as soon as the waters began to subside (and this subsidence is an important point in the system), gradually rose out of the primitive sea, forming the first dry land. The rocks which were in this manner first formed, Werner calls the *Original* or *Primitive Formation:* they consist of granite, gneiss, different species of slate, marble, and trap.

'The formation of these rocks, however, did not, it seems, exhaust the materials floating in the waters, for the deposition went on, and a class of rocks were formed consisting of grey wacké, limestone, and trap, which rested on the primitive, and are called by Werner the *Intermediate* or *Transition Rocks*, because, on their appearance above the waters, the earth, he conceives, *passed* into a habitable state.

'After the formation of those primitive and transition rocks, Werner alleges that the water suddenly rose over them to a great height, covering them in many places, as it again subsided, with a new formation of rocks, consisting of sandstone, conglomerates, limestone, gypsum, chalk, and rock-salt, which he called *Level* or *Floetz Rocks.*

'Since that period, the wearing down of the rocks, by the action of the weather and other causes, and the washing away of the worn materials by rains and streams of water, have formed soil, gravel, sand, peat, and the various other beds which are called *Alluvial.*' (p. 58—60.)

Into the details of these two systems, and the numerous objections to their several opinions, started and explained in the *Conversations*, we have not room to enter; and much less can we take up at present the still more rational and plausible system which Mr. Granville Penn has constructed from the Mosaic history of the creation and the deluge, and which is also fully treated of in the latter part of the volume. Our readers, however, may like to see a list of the subjects treated of in their order: these are, " Theories of the earth; Geological cabinet; First principles of the Wernerian system; Effects of expansion, arising from a central fire; Formation of ravines, vallies, and river courses; Origin of vallies, plains, marshes, bogs, and lakes; Order of rocks, with the origin of coal, and diffusion of gravel and sand in the sea; Consolidation and hardening of rocks; Mineral veins; Mosaic geology, as explained by Mr. Penn; Bones and shells in rocks and caverns, and in the soil; The great rock basins of London, Paris, and the Isle of Wight, with the extinct animals of a former world."

It may be objected to these *Conversations on Geology*, that they contain too many objections, and leave many parts of the subject in utter uncertainty: but we may be permitted to reply to this, that all the systems of geology are precisely in the state in which they are here represented, uncertain and imperfect in their theories and speculations; though these are generally illustrated by interesting and well ascertained facts, and sufficiently plausible arguments. The author of the *Conversations*, therefore, it would appear to us, has acted judiciously in representing the actual imperfections of geology, rather than concealing them, and in expressing doubts upon points imperfectly ascertained, rather than dogmatising.

P.

Art. III. *Catalogue of Works on Natural History, lately published, with some Notice of those considered the most interesting to British Naturalists.*

France.

Fontenelle, M. *Julia:* Bibliothèque Physico-E'conomique, ou Journal des Découvertes et Perfectionnemens de l'Industrie Nationale et E'trangère, de l'E'conomie rurale et domestique, de la Physique, la Chimie, l'Histoire Naturelle, la Médecine domestique et vétérinaire, enfin des Sciences et des Arts qui se rattachent aux besoins de la vie.

Among the collaborateurs in this extensive and important undertaking we perceive the distinguished names of Baudrillart, Bory de St. Vincent, Delille, Deyeux, Guillemin, Labarraque, Lassaigne, Lesson, Pelletan, Raspail, Richard, Tollard, Vergnaud, &c. &c.

Vatel, M. *P.*, Médecin-vétérinaire: E'lémens de Pathologie Vétérinaire, ou Précis théorique et pratique de la médecine et de la chirurgie des principaux animaux domestique. Tom. 2. 1e et 2e parties. Paris, 1828. 2 vols. 8vo, pp. 935.

Bois-Duval, M. *J. A.*, Membre de plusieurs Sociétés savantes: Flore Française, ou Description synoptique des plantes qui croissent naturellement sur le sol Français. Paris, 1828. 3 vols. 18mo, pp. 1120.

Ternaux, M., ainé: Sur les Obstacles qui s'opposent encore à la Propagation des Mérinos en France. Paris, 1828, 4to.

This work contains curious facts respecting sheep.

Macquart, M. *J.*: Insectes Diptères du Nord de la France (Platypézines, Dolichopodes, Empides, Hybotides). Lille, 1827. 8vo, pp. 159, avec pl.

Bory de St. Vincent, M. le Colonel: Résumé d'Erpetologie, ou d'Histoire Naturelle de Reptiles, accompagnée d'une Iconographie. 1 vol. 18mo, avec atlas, 18mo.

An exceedingly interesting and instructive production, by one of the first naturalists in France.

Germany.

Kreysig, Frédéric Louis: Ueber den Gebrauch der natürlichen und künstlichen Mineralwässer. Leipzig, 1828. 12mo, pp. 330.

This little work contains an account of the mineral waters of Carlsbad, Embs, Eger, Marienbad, Pyrmont, and Spa.

Mencke, Dr. *C. Th.*: Synopsis Methodica Molluscorum generum omnium et Specierum earum quæ in Museo Menkeano adservantur. Pyrmont, 1828. 8vo, pp. xii. et 91.

Harsweg, M.: Hortus Carlsruhanus, oder Verzeichniss sœmmtlicher Gewächse, &c. Carlsruhe. 8vo.

Transactions of the General Helvetic Society of Natural History: Verhandlungen der Allg. Schweizer, Gesellschaft, &c. Zurich. 8vo, pp. 160.

Perleb, M. *C.*: Lehrbuch der Naturgeschichte, &c. Elements of Natural History.

Leichtenstern, M. *de*: Umriss der Naturbeschreibung, &c. Elements of Natural History, &c. Berlin. 8vo, pp. 200.

Bluff, M. *J.*: Entwickelungs-Combinationen Organischer Wesen. Cologne. 8vo, pp. 51.

Duvernay, Dr. *G. L*: Discours prononcé le 22 Décembre, à l'Ouverture du Cours d'Histoire Naturelle de la Faculté des Sciences de Strasbourg. Strasburg, 1828. 8vo, pp. 418.

Holland and the Netherlands.

Anslijn, M. *N.*: Natuurk. Verhandel., &c. Catalogue of the Insects of the Netherlands, particularly those found in the vicinity of Harlem. 1828. Tom. 16. pt. 1. pp. 125.

Lejeune. M. *A. L. St.*: Revue de la Flore des Environs de Spa. Liége 8vo, pp. 263.

Art. IV. *Literary Notice.*

The *Arcana of Science and Art* for 1829 will be published early in January, and will contain all the popular discoveries and improvements of the past year, in mechanical and chemical science, natural history, rural and domestic economy, the useful and fine arts, and a miscellaneous register. The forthcoming volume will be somewhat larger than that of last year, and will be illustrated with upwards of twenty engravings.

PART III.

MISCELLANEOUS INTELLIGENCE.

Art. I. *Natural History in Foreign Countries.*

FRANCE.

Epinal, Oct. 15. — There is a small miscellaneous Museum here, but it is more remarkable for Roman sculptures and coins dug up in the neighbourhood, than for specimens of natural history. The attention to this science, however, is increasing, as appears both by the specimens lately purchased and added to the collection, and by the communications to a very useful periodical which appears here every three months, *Le Journal de la Société d'E'mulation.* There is a tolerable collection of minerals, and a number of precious stones of different kinds procured from the shrines of saints, or sacred relics of monasteries or convents, formerly existing in the department of the Vosges. A number of pearls have lately been taken from the fresh-water muscle (*M*ỳa margaritífera), found here in the river Valogne; and when the Duchess of Angouleme, who lately visited Epinal, saw those in the museum, she very patriotically ordered a necklace from the director and librarian, M. Petit-Jean, a liberal minded excellent man, who seemed to us to unite the best parts of the French and English character.

Strasburg, Oct. 19. — The Museum of Natural History here contains an extensive collection. It is more than usually rich in corals, sponges, star-fish, and marine Mollúsca. There is an excellent specimen of Astèrias càput Medùs*æ*, a great number of Gorgòn*ia*, of Scalària speciòsa, and of Cypr*æ'a*, and a pair of gloves manufactured from the fibres of *P*ínna nóbilis. There is an excellent collection of birds, especially those of Alsatia, which is rich in this division of animals, and contains some species found but in few other countries. Several species of owls, birds in which Alsatia is very prolific. *S*tríx uralénsis (the owl of the Ural mountains), rare, and worth fifty Napoleons. *C*érthia murària, only found in Alsatia. *T*rochilìdæ, a large collection. *C*haràdrius gállicus and Phænicópterus rùber, found on the banks of the Rhine. A considerable collection of fishes. Dìodon maculàtus. A good specimen of the rattle-snake. *S*òrex moscellàtus, from Siberia, very rare, presented by Pallas. Myrmecóphaga jubàta, the ant-eater, a remarkably fine specimen. Sciurópterus volucélla. One of the best collections of butterflies in existence out of Paris and Vienna; and the same may be said of the collection of organic remains, and petrified productions. *P*hysèter macrocéphalus, the head and part of the vertebræ. Large fragments of mammoths, elephants, hyenas, and other fossil quadrupeds. A good collection of minerals. Hyàlia roulé, a species of quartz found in the Rhine, but rare. A collection of the minerals of Alsatia, with those which have been applied to purposes of utility particularly indicated.

An apartment devoted to vegetable productions, contains the section of the trunk of a silver fir tree (*A*'bies pícea), called Le grand Sapin de Hochwald, a forest at Barr, in Alsatia. This tree was 150 ft. high, with a trunk perfectly straight and free from branches to the height of 50 ft., after which it was forked with the one shoot 100 ft. long, and the other somewhat shorter. The diameter of the trunk at the surface of the ground was 8 ft.; at 50 ft.

from the ground, 5 ft.; estimated age, 360 years. It was cut down on the 3d of June, 1816, the branches having begun to wither at the top, and the trunk to decay at the centre. There is another silver fir tree standing near where this one stood, nearly of the same height, and estimated to be of the same age. The forest of Hochwald (High-wood, in allusion probably to the height of the trees) consists almost entirely of silver firs, and before the revolution belonged to the town of Strasburg.

There is a good collection of specimens of different kinds of timber, which, instead of exhibiting a series of polished tablets, as is generally the case, consists of oblique sections of the trunk with the bark on, of the average size which the trunk attains. Specimens polished, and otherwise manufactured, are also exhibited; so that the collection becomes at once instructive to the botanist, and to the cabinet-maker and joiner. It also contains a collection of seeds, with their pods and other integuments or receptacles, arranged according to the natural system, amongst which the different cones of the Coníferæ, and the pods of Leguminòsæ, form very interesting assemblages; and a herbarium, arranged after the manner of Jussieu.

The whole of this museum is in excellent order. Among the quadrupeds and birds there is no appearance of moths, and at the same time no smell of camphor, or other preservative ingredients. On enquiring of M. Vinet what means he used to preserve in such excellent condition the objects under his care, he answered, "Nothing more than frequently inspecting them, airing them, gently brushing them over, or wiping off any thing extraneous, and keeping the cases perfectly clean." He observed that camphor, pepper, cedar wood, savine, &c., which were used by some housewives to keep moths from clothes, had been found perfectly useless if the clothes were not frequently taken out, brushed, and aired; and that if clothes were taken out frequently, and brushed and aired, no camphor or other ingredient was necessary to keep them from the moth, or other insects. The idea occurred to him that what held good in keeping furs, leather, woollen cloth, feathers, and other articles of dress, free from moths, might hold good in preserving the same articles in their unmanufactured state, and he tried it and was successful. The same idea has been applied in England to the keeping of specimens of plants, which require to be frequently turned over. To convince himself and others of the uselessness of camphor and other nostrums alone, M. Vinet has hatched moths in an atmosphere impregnated with camphor, and the other substances mentioned. This hint, as to the preservation of articles of dress made from animal substances, will, we know, not be lost on our female readers.

M. Vinet, besides being the keeper of this museum, collects and prepares objects of natural history for sale, and sends the natural productions of Alsatia to other countries.

The Botanic Garden here contains a tolerable collection, the hardy plants arranged in the Jussieuean manner. There are some good specimens of exotic trees and shrubs, of which the most remarkable is a Salisbùr*ia* *a*diantifòlia, the male plant, as in England, and almost every where else in Europe, which flowers freely every year! It is about 18 ft. high, and has no leading shoot, having been completely overshadowed for many years by an immense *Pópulus* angulàta, which was taken down about twelve years ago. Professor Nestler conjectures that the change of circumstances produced by the removal of the poplar, may probably be the cause of the inflorescence. A female Salisbùr*ia* is now planted beside the male, raised from a bud received from Professor Decandolle, who, some years ago, found accidentally, in a garden near Geneva, the only female plant at that time known in Europe. We suggested the idea of inserting buds of the female plant on the points of the extreme shoots of the male, thinking it probable that, by becoming a part of the same tree, it will become subject to the same disposition to produce blossoms. The amentums of the male flower are small, like those of the walnut. Other interesting specimens are:— Gymnocládus canadénsis, which flowers and fruits most abundantly every year, and the pods, which remain on the tree till spring, produce a fine effect during winter. *J*úglans nìgra, very large, and bearing immense crops of fruit. Quércus Cérris, 100 ft. high, flowers and fruits every year, but the fruit never ripens. *A*cèr monspessulànum, very large. Córnus alternifòlia, 18 ft. high. *Laúrus Sássafras, V*ibúrnum nùdum, *Lentàgo,* and *p*runifòlium, very large. *L*ýcium europæ'um, as a standard, laden with fine, large, deep red fruit; very ornamental. *L.* bárbarum beside it, with fewer, smaller, and paler-coloured fruit, and with ovate leaves, while the other has lanceolate leaves. Xanthóxylum *f*raxíneum, large; the male and female plant beside each other, and ripening seeds every year. A collection of wild gooseberries and currants, lately collected in the Vosges, among which it is possible there may be some new species or varieties. *S*ónchus Plumièr*i*, also from the Vosges; it grows 5 ft. high, with fine blue flowers, and large succulent leaves and stems which might probably be rendered useful in agriculture, and possibly even for salading. Lycopòdium denticulàtum, commonly kept in green-houses, and sometimes even in hot-houses, in England, but here growing most luxuriantly on a bed of peat, where it remains during winter, being covered with loose dry leaves. We may remark that the winters in England have at least ten times as many rainy days as those of the north of France, and that to render this plan of preservation successful in the former country, a covering of boards or of thatch matting would require to be suspended over the leaves.

The Empress Josephine Bonaparte, allowed by all parties to have been an excellent woman, and known as a great patroness of botany and gardening, resided three months at Strasburg in the year 1808. She walked almost every day in the botanic garden, conversed respecting the collection with the director and the gardener, and sent a number of exotics from Malmaison, among which the following have attained a large size, and some of them are obliged to be cut down every year when replaced in their winter quarters. Bánks*ia* præmórsa, *S*chìnus *Mólle,* Uvulària guineénsis; *A*càcia acanthocárpa, floribúnda, and lophántha var. coarctàta; *F*ìcus péndula, 12 ft. high, and now covered with yellow fruit, about the size of gooseberries; *Téctona* grándis, Cheirostèmon *p*latanöìdes; *E*uphórb*ia* *n*eriifòlia, 10 ft. high; Ekebérg*ia* capénsis; and *S*olànum auriculàtum, 10 ft. high, turned out of the pot every year in the open garden, where it attains the height of 15 ft., and forms a magnificent object of its kind, covered with flowers and fruit. There are two large date palms, and a number of the other old inhabitants of hot-houses, which we need not notice.

Metz, Dec. 8.—There is a small Cabinet of Natural History here, formed by M. Hollandre, the professor of natural history and botany and the librarian. He has prepared most of the subjects himself, and is obviously wholly devoted to natural science. He seems very properly to aim at collecting together something of every order in the different classes and families of animals and minerals, and has already formed a complete herbal of the plants which grow in the neighbourhood of Metz. The animals and birds are in cases, fitted up with three or more stories of stages, each stage of three or four shelves, according to the size of the subjects to be placed on them. As the mineral specimens are small, there are five or six small shelves to each stage devoted to that part of the collection. Nothing is gained in point of room by these stages, but a great deal in the convenience of viewing the objects placed on them. The cabinet tables in the middle of the apartment bear glass cases with small objects in the usual manner, and their interior contains a stage, facing the light, and enclosed by glazed frames, for objects of a larger size. The advantage of the stage disposition in reflecting the objects to the eye, is here strikingly obvious. Every specimen is conspicuously named in French, and after Linnæus or some more recent author. There are few Mammàlia, but a considerable collection of birds, the greater part prepared and mounted by the professor himself. All the birds of the department of the Moselle, and as many as possible of those which are indigenous to France, are contained in this collection; and as owls and the falcon family are much more common on the Continent than in Britain, these birds make the most conspicuous appearance. There is one large sea eagle which was shot in the neighbourhood; a bird which one would not have expected so far in the interior. The Flora of the environs of Metz is arranged according to the natural system; each specimen attached by narrow slips of paper to the third page of a folio leaf; the class, order, family, tribe, name, locality, &c., being inserted on the first page, under printed heads or titles, the last of which is "General Remarks." Unfortunately, the Professor being out of town, we could not ascertain the number of families, species, or rare plants; but we were assured generally by M. Clerc, the sub-librarian (whose grandfather, a native of Scotland, accompanied King James to France and settled there), that it was rich. M. Clerc is much attached to agriculture and gardening, and was a particular friend of the late Baron Tschoudy, of this neighbourhood, the inventor of the Greffe herbacée. There are a magnificent specimen of *Bolètus ramòsus*, and a very curious fragment of the trunk of a beech tree, which the Professor discovered in the street when passing by a man who was sawing up some fire-wood. This fragment is a portion separated longitudinally from a cross section of a tree, which may have been 18 in. or 2 ft. in diameter, and from fifty to sixty years of age. At the age of fifty years, some person had cut in the bark, and through the liber and alburnum, the form of a cross, about a foot long, and had, by some means or other, blackened or oxidised (or probably the weather might have effected this) the denuded surface which formed the cross. The tree had been felled about ten years afterwards, and happened to be split by the wood-cutter, exactly at the layer where the cross was formed; the fragment now displayed a black cross on the wood or interior side, and a corresponding cross on the bark side of the section, though the two are three inches apart from each other. On counting the layers of wood between the internal and external cross, it appears that the former had remained two or three years uncovered, because two or three layers are lost there; but eight between the inner cross and the bark are very distinct. In the effort of nature to cover the cross, a portion of bark, which had formed the edges of the wound, had been completely enclosed and covered with wood, and still remains sound, but not lignified. This fragment is not described as being particularly important, in a physiological point of view, but still it shows that the accretions to a timber tree are added from without, and that bark cannot be changed into wood, any more than the skin of an animal can be turned into flesh. There is a very complete collection of specimens of timber of all the trees which the late Baron Tschoudy knew, and proved would bear the open air in the department of the Moselle; indeed the greater part of the specimens were taken by M. Hollandre from trees planted by the Baron; but we must reserve further particulars respecting this museum, and other subjects connected with Natural History at Metz, till we can seee Professor Hollandre, the plantations of the late Baron Tschoudy, and the Natural History Cabinet of M. Meslier de Rocan.

The Botanic Garden here is small, but not without interest. It was formerly the garden of a convent of Capuchins, whose church now forms a very good orangery, and contains 140 large handsome trees, some of them 20 ft. high, and a *Magnòlia grandiflòra* exceeding that height, and finely furnished with branches and leaves. This change took place about twenty-eight years ago, at which time the present curator, M. Coutie, a native of Strasburg, who has been three years in Paris, and six years in England,

and is, consequently, a very superior botanist and gardener, was appointed to its management. The hardy herbaceous plants are arranged in beds edged with box, according to the natural system, and the hardy ligneous plants are also arranged according to that system, at the north end, and along part of two sides of the garden, leaving the area open to the south. There are none of the specimens of extraordinary magnitude, but some are worthy of notice for the progress they have made in twenty-eight years. The largest specimens belong, of course, to the genus *P*ópulus; but *A*cer, *T*ília, *B*étulus, *P*ìnus, *P*látanus, and some other genera, have attained respectable dimensions. A handsome specimen of Guilandìn*a Bónduc* is here; and a *T*ília argéntea, grafted at the height of 6 ft. upon a common lime tree, the diameter of the stock about 1 ft. 6. in., while that of the graft projects abruptly, like a capital of a column, nearly 1 ft. all round, so that the diameter of the graft is upwards of 3 ft.; the head is ovate, about 50 ft. high, and 30 ft. in diameter. Other specimens which have grown vigorously are, *P*ìnus romàna, sylvéstris, *Mùghus* (such as we saw in abundance in the neighbourhood of Munich), marítima, and Larício; *L*àrix americàna *R*hús Toxicodéndron, and *H*ippóphaë *r*hamnöìdes. The first plant which attracted our attention in the stove was *Anòna Cherimòlia*, 15 ft. high, in a pot not quite a foot in diameter at the surface. It was raised from seeds, about twenty-eight years, ago, and fruited six or eight years ago. It produced, in two years, nine or ten fruit, about the size, shape, and colour of oranges, and very palatable. The seeds were perfect, and young plants have been raised from them, which are now nearly as large as their parent. There is a specimen of *F*ìcus bengalénsis, nearly twenty feet high, with a root proceeding from the trunk at the height of twelve feet from the surface of the pot. This root, without any assistance from art, has descended to within 1 ft. 8 in. of the ground; and the fibre, in its descent, has in some places become monstrous, and expanded into a lamina nearly half an inch broad. Having in this state left off growing, the recommencement of growth was in the form of small round fibres from the lower extremity of the lamina; these, in their turn, have again become monstrous, and the tongue-shaped monstrosities again fringed with fibres, so that the entire tissue of roots has rather a singular appearance. Nothing can prove more clearly that the fibres of plants, like the leaves and every other accretion, are nourished by the prepared sap of the plant directed towards them, and not immediately by the substances which the roots absorb from the ground, water, or air; just, in short, as an animal is nourished by its blood, and not immediately by the food received into its stomach. There is a fine plant of Bómbax pentaphýllum, 15 ft. high, and only ten years old, raised from seeds received from Kew. Ehrèt*ia t*inifòlia, Malpíghi*a* ùrens, and *P*ìper reticulàtum, received from the late Mr. Loddiges. *P*sídium montànum, 15 ft. high. Stercùlia *p*latanifòlia, upwards of 20 ft. high, raised from seeds, twenty years ago. In the green-house there is a considerable collection of Cape and Australian plants, the greater part received direct from Kew gardens, either as seeds or small plants. Massòn*ia* pustulàta, Prímula sinénsis, and fourteen sorts of *C*hrysánthemum, are the principal plants in flower. M. Coutie, though within three weeks of being eighty years of age, is still as fond of plants as ever, and showed us some recent arrivals from M. Cels, of Paris, which he had received in exchange; a proof, if proof were wanting, of the congeniality of botanical and gardening pursuits to age, which ought to induce such as are young to take every reasonable opportunity of laying in a stock of ideas on these subjects, for use in that period of life. Of the numerous nurseries and gardens in the neighbourhood of the town, and of the pine-apples grown in this garden for the use of the Mayor of Metz, we shall have to speak in the Gardener's Magazine. — *Cond.*

Researches on the Pollen of Plants and the ultimate Particles of Matter.— The Academy of Sciences, at their Meeting of Dec. 8., heard the report of MM. Cassini, Desfontaines, Mirbel, and De Blainville, on a memoir on Pollen and the Spermatic Granules of Animals, by M. Adolphe Brongniart. In a former memoir on the same subject, this gentleman had detailed some interesting and accurately analysed facts; on the theory contained in it the Committee had not given any opinion, but had requested the writer to persevere in his observations. In a subsequent paper, M. Raspail, an experienced microscopic observer, had combated the opinions of M. Brongniart, and endeavoured to demonstrate that the granules contained in the grains of pollen, so far from being analogous to spermatic animalcules, are not even organised bodies. After adverting to these memoirs, M. Cassini noticed the opinions contained in a paper by the celebrated English botanist, Mr. Robert Brown. This gentleman thinks, with M. Brongniart, that the granules of pollen are endued with a distinct and independent motion; but on various theoretical points he differs from him. He has not only observed this motion in the granules of living plants, but has also perceived the same property in those of plants dried for a century, and preserved in spirits of wine, and in those of mosses and equisetums living or dried; in the molecules obtained by triturating in water the organic tissue of animals or vegetables living or dead; and in those obtained in the same manner from all sorts of inorganic substances, as glass, granite, &c. In short, he thinks that all the active molecules, organic or inorganic, are the same in nature, form, and size, and endued with the same properties; and not in the least different from those observed in pollen by M. Brongniart.

In the present memoir, which is principally devoted to the refutation of M. Raspail's objections, M. Brongniart cites, in support of his own mode of observation, the curious fact, that plants made to flower in winter, by means of shelter and artificial heat, have generally their grains of pollen filled with a mucilaginous substance, devoid of regular and moving granules; and, as these plants rarely fructify, he thence draws an inference favourable to his system.

Thus, then, the question discussed by M. Brongniart is now debated by three very skilful observers, and resolved in three different ways: for, whilst M. Brongniart admits, in the interior of grains of pollen, regularly organised corpuscles, of a very peculiar nature, distinct from all other bodies, analogous to spermatic animalcules, and essentially destined to produce the embryo; M. Raspail sees nothing in these corpuscles but little resinous masses, shapeless, variable, and absolutely deprived of organisation and of life; and Mr. Brown, discarding at once the exclusive opinions of both, admits in all natural bodies, whether organic or inorganic, active molecules of the same form, size, and nature, and exhibiting a spontaneous motion as soon as they are disintegrated and plunged in fluid.

The Committee, on the one hand, agreed with M. Brongniart and Mr. Brown, that the causes to which M. Raspail attributes the motion of the granules, exercise, in reality, no influence over them; and, on the other, they coincided with Mr. Brown, that various inorganic bodies, triturated in water, offer, if not always, at least sometimes, corpuscles whose size, form, and motion are nearly the same, under the microscope, with those of the granules of pollen. They also remarked, that the resemblance between the active molecules of Mr. Brown and the spermatic granules of M. Brongniart, furnishes strong presumptions against the hypothesis of the latter. They called the attention of botanists to the singular phenomenon of apparently spontaneous motion, and asked if it might not be attributed to mutual attraction and repulsion. Great difference was observed in the manifestations of this phenomenon; so much so, that, under circumstances to all appearance alike, the granules of the same plant at one time exhibited a very perceptible motion, and at another perfect immobility.

"Such," said M. Cassini, "are the external appearances. But must we, from these, necessarily conclude that the internal nature, and all the properties and functions, are absolutely the same, in bodies of so different origin? On this we have not had the temerity to decide; it can only be done after researches much more numerous and profound than we have been able to make." (*Le Globe*, Dec. 13.)

GERMANY.

Munich, November 6. — The attachment of the late King of Bavaria, Maximilian Joseph, to the pursuit of natural history, was evinced by the expedition of Drs. Spix and Martius to examine the natural productions of Brazil; by the botanic garden at Munich, and by the rich collection of exotics in the hot-houses at Nymphenburg, in the neighbourhood of that capital. The Museum of Natural History is also much indebted to the late King, and especially for the Musèum Brasiliànum, which contains a great number of articles, collected by Drs. Spix and Martius. The present king does not neglect natural history, and has lately purchased in Holland upwards of twenty large specimens of palms, which have been conveyed to Nuremburg; but his attention is chiefly directed to the advancement of agriculture and other arts of industry, and to the fine arts. New roads are projected; a rail-road (the climate being unfavourable for canals) to join the Rhine and the Danube is talked of; an immense building for containing a collection of pictures is in progress, and one for a collection of antique sculpture nearly completed. Works like these constitute the capital of a country, by which its industry is employed to advantage; and though galleries of pictures will not return to the nation the same interest on their cost, as money laid out on roads, bridges, general drainages, &c., yet in the way of attracting strangers, such expenditure will bring something; and, at least, more than money laid out in multiplying palaces, which are much less interesting to mankind in general, and which cannot, like gardens, museums, and collections of objects of art, be enjoyed by every body, and afford instruction and entertainment at the same time.

The Museum of Natural History at Munich may be divided into two parts; the original collection, and that from Brazil. The former is arranged according to the Linnean system, and may be considered as extensive. Among the Mammàlia are good specimens of the rhinoceros, the elephant, the reindeer, the elk, and, as an interesting curiosity, the horse of the late Count Rumford, on which he is said to have rode out of Munich, to hold a conference with the army of Condé, and on which occasion he prevented the threat of that army to burn the town from being carried into execution. The collection of birds combines also a collection of nests and of eggs. The birds are placed on sloping stages, enclosed in upright glass cases; the advantage of the slope is that the objects receive the light from the windows, and reflect it to the eye of the spectator, at a better angle than when placed in ranges of shelves rising perpendicularly. Among the insects is an excellent collection of exotic butterflies, and the Mollúsca and Zoophites are numerous.

The Musèum Brasiliànum, besides a great many domestic, personal, warlike, and regal instruments and ornaments of the Indians, contains large specimens of the siren and the dolphin; a beautiful assemblage of birds; a snake above 30 ft. in length; skeletons of Mammàlia, including those of two alligators; and a great many specimens of amphibious animals, fish, shells, and insects. Among the minerals is a large fragment of meteoric stone. Respecting the description of this collection Dr. Martius has published the following

"*Literary Notice.*— The sudden death of his fellow-labourer and travelling companion has given occasion to Dr. Martius to notify to amateurs, and to the subscribers to the literary undertaking relative to his voyage to the Brazil with the deceased, that the description of that voyage will be continued, the King having communicated to him the papers of the late Dr. Spix. The greater part of the second volume, and of the atlas, is already printed. It being impossible to comprise every thing in this second volume, a third, without an atlas, will by necessity be published, which will contain the voyage on the river Amazon, and some geographical, statistical, and physical details. Dr. Martius will study to keep the work within moderate limits, so that it may be sold at a reasonable price; the atlas will contain twenty sheets, instead of fifteen, as originally announced, with views, portraits, &c., a second sheet of the general map of South America, and several subordinate maps.

"The botanical works will also be continued on same principle. The genera and species of palms will be finished with the delivery of the fifth part, and the Nòva Génera Plantàrum will be completed by a third volume, which will contain a very curious monograph of Cryptogàmia, half of which, on twenty-five plates, is already finished.

"The description and figures of the the fishes of Brazil, which death prevented Dr. Spix from completing, will be published by Dr. Martius, who hopes to effect all these objects with respect to Brazil in the course of two or three years, and in this manner to give an idea of the riches, in natural history, of a country which, in every respect, merits the attention and the interest of Europe.

Dr. Martius's works already published are:

1mo de la description du voyage: le 1mier Volume (en allemand) avec un Atlas de 15 grandes feuilles lithographiées, une feuille supplémentaire de musique et la partie septentrionale de la carte génerale de l'Amérique méridionale. Edition Velin Imperial, *4l.* 14*s.* 6*d.*; Royal, sans l'Atlas, 1*l.* 1*s.*; Edition in English.

2do des ouvrages botaniques:

1. Mart. Palm. Gen. et Species, grand in folio avec 108 tableaux, contenant en partie l'analyse des palmiers et en partie des palmierés répresents dans des paysages tropiques. Prix color. 32*l.*; en noir.
2. Mart. nova Gen. Plant. Imperial-Quarto 1er et 2d volume, avec 200 tableaux. Vol. I. color Imp. Quarto, 16*l.* 16*s.*; Vol. II., 16*l.* 16*s.*; Vol. I. et II. en noir.

3d des ouvrages zoologiques: Testacea fluviatilia, descripsit Wagner, Imp. Quarto, 29 tab. *4l.* 4*s.*

S'addresser à Treuttel, Würtz, et Richter, London.

Dr. Martius is at present occupied with an original and ingenious theory of the structure of plants; the Doctor gave some account of it a few weeks ago at Berlin, where it excited a great sensation; it will very soon be published in a German periodical, and we are promised a copy on its first appearance, for the purpose of translating and laying before our readers. In the mean time we put down one or two ideas recollected from a general outline of the theory which the Doctor stated to us. The knot, or joint, of plants with stems, or the collar of plants without stems, contains the life, and is for all the purposes of reproduction as perfect as the seed. The leaves of plants are protruded from the stem in the order of circumvolving lines; the fifth or the sixth leaf will always be found over the first, and no plant can produce a flower till the leaves have made at least one circumvolution. The flower and all its parts are but modifications of the leaf; and the calyx, the corolla, and the stamens follow the same law in their developement as the leaves. The whole of that part of the plant which is above ground, may be described as a travelling leaf. Supposing this theory to be supported by facts, the uses to be derived from it, in vegetable culture and scientific description, are various and important. In the first place, an end will be put to the doubts respecting the comparative durability of plants propagated by extension, and those propagated by seeds. In the second place, from details which we cannot fully enter into, the descriptions of natural orders and genera may be reduced to short definitions, and the employment of signs, somewhat in the manner of algebra, be adopted, instead of long descriptions. Dr. Martius showed us a proof-sheet, in which a number of natural orders, beginning with *R*anunculàceæ, were defined in less than two lines each, and some in only one line, by signs and numerals. We shall not follow these very remarkable views further, lest we should fall into error, and because we hope, in our next Number, to give them in more detail.

It is possible that, as the study of natural science advances, the language of scientific description may be greatly simplified and abridged. This has already been done by Linnæus, and may be carried still farther by such inventions as that of which we have endeavoured to give an idea. It is more easy to conceive this, than it is to conceive with what facility, and in how short a time, a knowledge of all the objects of natural history may ultimately be acquired; and that which is at present considered learning and science, and confined to a few specially devoted to it, may at length be universally possessed in every civilised country, and in every rank of life. To have speculated, two centuries ago, on the probability of all the inhabitants of a country being able to read, write, and count, as they now are in Bavaria and Wurtemberg, would not have been thought more preposterous than to assert, at the present day, the practicability and probability of mechanics, chemistry, and natural history being, two centuries hence, common acquirements of the country labourers of Europe.

Ratisbon, Nov. 10. — There are a Botanical Society here and a small Botanic Garden. A periodical, exclusively devoted to botany, *The Botanische Zeitung*, has been published at Ratisbon since 1801. Its projector and first editor was Dr. Hoppé, the president of the Society; and its present editor is his pupil, Dr. Eischweiler, who has lately commenced another periodical, in like manner exclusively devoted to botany, entitled *Literatur blinker für reine und angew-andte Botanick*, &c. The Doctor is of opinion, that there ought to be a periodical exclusively devoted to every separate division of natural history and literature; for he finds, in the present state of things, in which one journal embraces so many objects, that he cannot discover every thing which is published respecting botany, though he devotes himself entirely and exclusively to that science, and has access to all or most of the periodical publications of Europe. The *Bulletin des Sciences Naturelles* of Baron Férussac, which he acknowledges to be the most complete thing of the kind in existence, he says, does not contain notices of the half of what is published in Germany on natural history; and his own journal, he doubts not, is likely to be deficient, both in respect to England and America. The truth is, that ninety-nine hundredths of what is published in the world of literature is mere repetition, in one country or language, of what has been published in another, or known long before. What is really new is like a grain of wheat in a bushel of chaff. At all events, we are certain of this with respect to agriculture and gardening, in which there has been very little novelty since the time of the Romans, who, on their part, seem to have added nothing to what was known to the Greeks. With the progress of things, it is probable that the literary men of every country may finally arrange themselves in one grand republic; and that all which is already known and worth becoming acquainted with, in each particular department of science and literature, being fixed in one elementary and fundamental work, a committee of the whole world, for each particular department or subdivision, may be employed to record the increments which are added to each as they are discovered. There will then be such periodicals as Dr. Eischweiler would approve of. In the mean time, it must not be forgotten, that the nearest approximation to such a state of things has been made by the Baron Férussac, in his system of *Bulletins Universals des Sciences et des Arts,* a work which, it is to be hoped, will meet with such encouragement as to enable its conductor to render it as perfect as the present state of things admits of.

Nuremberg, Nov. 12. — There is neither botanic garden nor public collection of natural history here; but there is a lady, Madame de Hepp, who is one of the greatest botanical amateurs in Germany. Her collection of hot-house and green-house plants is the most extensive which we have seen in Bavaria, next to those of the government at Munich, and of the king at Nymphenburg. This lady makes an extensive journey almost every year, to see what is new or rare in Holland, France, Prussia, and Austria; and no price deters her from purchasing what she considers desirable. She has also an aviary with a variety of birds. The garden of Madame de Hepp is close to the town, beautifully laid out, and highly kept; but of this we shall speak elsewhere, though we cannot help adding, that we have seldom been more delighted than when we were conducted through it by this charming woman.

Stuttgard, Nov. 21. — There was formerly a very considerable menagery here, the private property of the late king: but it was given up on the present king's accession to the throne; some say, as being too expensive to support; and others, because the king is so great a lover of liberty, that he cannot bear to see any animal in confinement, not even birds in cages. The inhabitants of the menagery were poisoned by prussic acid, and stuffed for the Cabinet of Natural History; where they may now be seen, bearing, with other objects there, evidence that this institution also is found rather expensive to keep in order. It deserves to be noticed, that the academy of Stuttgard, celebrated about thirty years ago, and in which were educated several great men from every part of Europe, many of them now living, no longer exists, and for the same reason. The building is now occupied by the king's private library; and the grounds, for every pupil of the academy had a small garden for his recreation, have been levelled, and formed into an English garden, in front of what is called the New Palace. The truth, probably, is, that poor kings, like other poor men, are generally blessed with large families; like other poor men, they, too, feel it necessary to economise; and collections of natural history, being luxuries, are dispensed with, in order to build palaces, and lay out gardens, for the rising generation of princes. This evil, however (which, it must be observed, neither applies to Wurtemberg nor Bavaria), like other evils, will, in time, work its own cure; and what was proposed to be brought about in some of the German states, in the beginning of the present century, and rejected at the time, will, probably, before the century is completed, be adopted as the result of public opinion throughout Europe, and as matter of necessity.

The Museum of Natural History is placed in a very suitable building, and, compared with the collections at Strasburg and Munich, is respectable. In every department there are species of most of the Linnean genera; and, in the class of birds, there are several hundreds, not yet mounted, which have been sent from the Cape of Good Hope by Ludwig, a native of Wurtemberg, resident at the Cape, and a great lover and promoter of natural history. A considerable proportion of the articles are neither arranged nor named; some of those which have names do not present the labels to advantage; and the cases, in respect of light and the convenience of the spectator, are not either so favourably designed or placed as in the museums of Strasburg and Munich. These defects are not the result of any want of skill or anxiety on the part of the naturalists who are connected with the establishment, Professors Jager and Bopp, but are evidently unavoidable, for want of funds. The most remarkable objects, and, happily, those which require least expense for their preservation, are, specimens of the mineral products of Norway, Iceland, and Siberia; a collection of fossil bones of the mammoth, elephant, stag, horse, and other animals, dug up at Canstadt, near Stuttgard, which are frequently referred to by Cuvier (who was educated at the academy here), Buckland, and other authors. There is also a collection of specimens of native marble, of which the most remarkable variety is that of Böttingen, which, being formed of an agglomeration of stalactites, when sawn up longitudinally, presents the appearance of purple stripes passing into white, and, of course, transversely, of concentric circles similarly coloured. As an appendix to this museum, there are a number of curious pictures, books, relics, and other articles, selected from the suppressed convent, among which is a portrait of the Countess of Salzburg, who, at the age of fifty years, had mustachios, whiskers, and a beard, as long and black as those of any man.

The Botanic Garden here contains a tolerable collection; the herbaceous plants are arranged according to the Linnean system; and the trees and shrubs grouped in masses, after the natural orders of Jussieu. To zoology and botany, however, Wurtemberg has contributed less than to geology, the fossil remains of this part of Germany being highly interesting. On this subject we are promised communications, from time to time, by the correspondent whom we have had the good fortune to establish here.

Heidelberg, Nov. 25.—A Museum of Natural History was commenced here in 1821, and has already made considerable progress. The collection of birds is very considerable: they are arranged in glass cases along the sides of a narrow gallery, and each subject has a label of green paper pasted on the glass, with the name printed, according to Linnæus, Cuvier, or such other modern naturalist as may have proposed a nomenclature which has been received in the scientific world, in French and in German. As good specimens in excellent preservation, were pointed out to us, *V*últur fúscus, Fálco Albicílla; Gapeàtus barbàtus, young and full grown; *O*'tis tárda, Trínga púgnax, Vanéllus melanogáster, *T*úrdus ròseus, Rhýnchops nìgra, and a number of others, which we had not time to note down. The other divisions of zoology are not yet so rich; but there are a great many specimens of reptiles and amphibia, and a good many insects; each insect fixed in a small case, with a glass bottom and top, which admits of viewing it minutely and completely on both sides, and without derangement. Every day this collection is receiving accessions from different quarters. Much taste and spirit are shown by those who have commenced it and are promoting its progress; and the curator, who shows it to the public, is a man who takes the greatest pains to excite an interest in the spectator, by pointing out the more interesting specimens, and accompanying his indications with short historical details.

There are two Botanic Gardens here: one adjoining the museum, chiefly for the sake of the medical students, and containing a collection of herbaceous plants, arranged according to the Linnean system; the other on the eminence on which stand the ruins of the castle of Heidelberg, containing a collection of hardy trees and shrubs for the students of forest culture (forstwissenschaft), and also a collection of agricultural plants for the students of agriculture (ackerbau). Forest culture is a subject of great importance in densely peopled countries, where wood serves not only for the purpose of architectural construction, but is the only fuel. The garden round the castle is well known and justly celebrated for its picturesque beauties, its antiquities, and its views of the town and the valley of the Neckar. The agricultural garden contains one of the most extensive collections of Cereàlia cultivated in Europe, unless we except that of M. Lagasca, as far as respects the genus *T*ríticum. The director of these gardens, M. Metzger, has written *Europaeische Cerealien in Botanischer und Landwirthschaftlicher Hinsicht*, &c., Heidelberg, 1824, folio, 20 plates; a work of which we have already given a short account in the *Gardener's Magazine*, and which, on our return to England, we hope to make better known. In the mean time we may state that M. Metzger cultivates, yearly, a bed, about 30 ft. long and 4 ft. broad, of each of the marked varieties of Ceràlia grown in Europe, of which he willingly distributes the seeds to all who will make a good use of them. We declined accepting of a collection which he offered us till we could find an East Lothian farmer, or some nobleman like the late Duke of Bedford, who would undertake to cultivate them, and persevere in their culture, till their comparative value, with respect to Britain, be ascertained. M. Metzger is a learned and scientific gardener of great ingenuity; he lives in a habitable fragment of the ruins of the castle, has a considerable library of gardening and topography, and a good herbarium. He keeps an assistant and an engraver, and is occupied in preparing, among other works, *A Description of the ancient and present State of the Castle and Gardens of Heidelberg*, in which some very curious information will be given from two very rare works; the one describing the ceremonies which took place on the arrival at Heidelberg of Elizabeth, daughter of James the First of England; and the other *Hortus Palatinus a Heidelbergæ extructus, S. de Caus Architecto*, 1620, in folio, with many plates. M. Metzger has also, in his own room, by a very simple process, which he has described to us, prepared paper, resembling that of the Chinese, from the bark of *M*òrus papyrífera; and a still more perfect paper, peculiarly adapted for taking tracings of drawings, from the roots of *A*lthæ̀a officinàlis. Both processes we shall elsewhere describe.

The grounds adjoining the castle occupy several acres, and are laid out with winding walks in the natural style. The trees and shrubs are not arranged according to any system, because the collection has been assembling for several years; but each genus is kept by itself, and the individuals are disposed on the turf in natural or picturesque groups. Every species and variety has placed by it a tin label on an iron rod, on which is written the Linnean name and synonymes, the German name, the natural order (?), and the native country. Close to the building, and also within its ruined walls, it is in contemplation to have collections of alpine and other herbaceous plants, and small American shrubs. These gardens are open to every body, and constitute one of the principal promenades of Heidelberg. There are not many instances in which the grounds of ruined castles, or what may be called the feudal wastes of ancient cities, are arranged in so instructive and agreeable a manner; and we should like to see something of the kind imitated here and there in Britain, for instance, at Ludlow, Stirling, &c.

The museum and clinical botanic garden occupy what was formerly a monastery and its burying ground; a change of destination not less beneficial to society.

At *Schwetzingen*, in the post-house, we witnessed, for the first time, what we have since seen frequently, an amusing application of zoological knowledge, for the purpose of prognosticating the weather. Two frogs, of the species *R*àna arbòrea, are kept in a crystal jar, about 18 in. high and 6 in. in diameter, with a depth of three or four inches of water at the bottom, and a small ladder reaching to the top of the jar. On the approach of dry weather, the frogs mount the ladder; but, when moisture is expected, they descend into the water. These animals are of a bright green, and in their wild state here climb the trees in search of insects, and make a peculiar singing noise before rain. In the jar they get no other food than now and then a fly; one of which, we were assured, would serve a frog for a week, though it will eat from six to twelve in a day if it can get them. In catching the flies put alive into the jar the frogs display great adroitness. In the gardens and hot-houses of Schwetzingen are extensive collections of plants, but nothing in the way of zoology or mineralogy worthy of remark.

Carlsruhe, Nov. 30. — In the Museum here there is the best collection of shells which we have seen out of Paris, in excellent preservation, but, unhappily for the visitor, not named. A number of the specimens are very striking, from their size or singularity of form; and of some of the rarest, as of the Geometrical Stair (?), there are duplicates and triplicates. The collection was made by degrees, at the expense of the late Marchioness Caroline Louisa, known to botanists by the genus of exotic trees Carolíne*a*. Of the C. prínceps there is a dried specimen, framed and glazed, suspended in the museum. The collection of Mammàlia and other zoological subjects is limited, but still respectable, though not in remarkably good order, and none of the species named. Among the curiosities is a fibrous or fox-tail root of *P*ópulus itálica, the thickest part of which does not exceed one fourth of an inch, while its length is 24 ft. A small root had found its way into a wooden pipe which conveyed water to a fountain, and gradually increased in length and in number of fibres, lessening, of course, the quantity of water delivered, till at last the current was entirely stopped, when, the pipe being taken up, the root was removed.

The collection of minerals is rich. Besides the granites, marbles, ores, stalactites, petrifactions, crystallisations, salts, agates, and other rare stones of the country, there is a collection of Siberian minerals, presented by the late Emperor of Russia, containing emeralds estimated to be worth 14,000 florins; a mass of rock crystal, 2 ft. square by 18 in. deep, for which, according to the guide, two Englishmen offered 20,000 florins; a number of large masses and beautifully formed specimens of rock crystal, from St. Gothard; a piece of the trunk of a petrified beech tree, 2½ ft. in diameter and 5 ft. long; bones of the head and legs of a mammoth; the head of a rhinoceros; a great number of impressions of fishes, plants, leaves, &c. The apartment in which these articles are exhibited is too small, and it is also badly lighted; still the collection is very interesting, and we cannot but regret that it is not placed in a suitable building, with all the articles conspicuously named, and a careful and skilful attendant appointed to keep the whole in proper order. We think it would contribute to the instruction and enjoyment of the public who visit such museums, and especially of country people who have not much leisure for reading or the culture of their minds, if a professor or professors were appointed to show and describe the articles, and even if the professors were to accompany their indicative remarks by others of a scientific, philosophical, moral, or theological character, according to the apparent wants and wishes of the visitor. It would not cost the three governments of Baden, Wurtemberg, and Bavaria, for each professor of this description, more than what it now costs them for each couple of game-keepers. Gmelin, the professor of botany here, is said to be occupied in preparing a catalogue of this museum; but, as he was at this time absent, we had not an opportunity of ascertaining what progress he had made.

There was formerly an interesting menagery in the grand-ducal garden here, kept up at the expense of the same munificent princess, who devoted, as we were told, her pin-money to the formation of the collection of shells in the museum, already mentioned; but, at her death, the menagery was sold, and, as at Stuttgard, the skins of some of the animals are now in the museum.

The Grand-Ducal Botanic Garden is known, by the *Hórtus Carlsruhànus*, to contain one of the first collections of exotics in Germany. Chamæ'rops hùmilis ripens perfect fruit here every year, the plant bearing both male and female flowers. Wistària Consequà*na* (Glýcine sinénsis) appears to have been introduced here long before it was known in Britain, there being a large plant against the end of a green-house, which has been there for upwards of fifteen years, under the name of Glýcine arbòrea: it is as hardy as Glýcine frutéscens, flowers profusely, and ripens seeds, from which young plants have been raised. American trees and shrubs thrive remarkably well; they are not planted in peat earth, as in England, but in rotten wood, mixed with common garden soil. Andrómeda arbòrea has attained the size of a tree, and ripens seeds every year; Dírca palústris is large, and has also perfected seeds, from which plants have been raised. Many other interesting particulars we omit, as belonging rather to gardening than natural history: but we must notice a very extensive collection of seeds, perhaps 1000 species, in small flat crystal bottles, conspicuously arranged and named; and a collection of woods, indigenous and exotic, perhaps 100 species, each specimen in the form of a book, lettered on the back, and placed in a bookcase. In the green-house of this garden, as in that of the botanic garden of Heidelberg, plants of Vallisnèria spiràlis, male and female, are kept for the purpose of illustrating the sexual system.

In the centre of the principal green-house there is a fountain, and over it a large wire cage, containing a collection of hardy singing birds, which, when those parts of the windows that are opened for air are covered with wire netting, are allowed to fly about the house; but as they are only fed in the cage, or rather wire tent, they always return to it, and are easily re-enclosed. In the bark bed of the stove, M. Harsweg, who is a great lover of insects, inserts the eggs of *S*carabæ`us nasicórnis *Lin.*, a singular-looking beetle, in the beginning of February: the perfect insects appear in the course of the summer, and in the evening fly about the garden, and add to the variety of twilight sounds and insect forms. The eggs, unlike those of the common cockchaffer, which require upwards of a year to become perfect insects, are perfected in the course of three or four months. He has not found that this beetle does harm to any thing, though he has found the common Rose Cockchaffer, in its winged state, attack and eat ripe pine-apples. He also observed that the *S.* nasicórnis, or the Horned Cockchaffer, frequently deposited its eggs in soft earth and rotten dung in the open air, but that they were always destroyed by the winter frost; so that there is no danger of their being naturalised in Germany. Those who wish to try this experiment, may procure the eggs, as well as those of a number of other curious insects, from, or through, M. Cels, nurseryman, Montrouge, Paris.

Koelreuter (known to botanists by his name-plant, Koelreutèr*ia* paniculàta), who was formerly professor of botany here, is said to have made a great many observations on the pollen of plants. The Chevalier Zeyer, the garden-director of Schwetzingen, a scientific and ardent botanist, who has formed and collected a herbarium of upwards of 20,000 species, informs us that he has seen drawings, by Koelreuter, of the magnified particles of pollen, of upwards of 2000 genera; that Professor Koelreuter considered that every genus that was truly distinct had a distinct form of pollen, and that the magnified figures of the ultimate particles of pollen would probably be found the most definite of all generic distinctions. The drawings are in the hands of his son, a physician here, who, it is regretted by M. Zeyer, does not communicate them to the public, or state his reasons for withholding them.

We have brought away from Carlsruhe one live *R*àna arbòrea, not being able to procure a second or third individual; plants of Vallisnèri*a*, a genus which, we believe, is not yet introduced into England; and, as *souvenirs*, Wistàr*ia* Consequà*na*, Andrómed*a* arbòrea, and Dírca palústris, raised from seeds ripened at Carlsruhe. We hope we shall be more successful with Vallisnèri*a* than we were with Salvíni*a* nàtans in 1819, which we succeeded in bringing from Lago Oscuro to Paris, but lost there, by placing it, floating in a vessel of water, on the outside of our chamber window, whence it could only be taken by sparrows or swallows. The grief and pain of disappointment that we experienced on this occasion, can only be understood by those who have had a similar trial, or who know, from reasoning and reflection, the value which care and labour give to any thing; in short, who can apply the theory of the value of labour metaphysically as well as physically.

Man in the South of Germany. — It cannot be altogether foreign to natural history, to notice the influence of climate, food, and political and religious regulations on the human species; and we are unwilling to leave Germany without saying something on so interesting a people as the Germans. It will not be denied that man is subject to the same laws as other animals, and that his natural or inborn character must depend principally on the climate and products of the soil where he is placed. His factitious, or civilised, character will as certainly depend on his education, taking that word in its most extensive sense, as including parental care and example, scholastic tuition, religion, and government. In warm fertile countries, where nature produces every thing spontaneously, man becomes inactive, and has naturally few labours and few enjoyments. In extremely cold and inhospitable climates, the enjoyments of man are also few, because the labour necessary to overcome natural objects is too great for his powers. It would seem, therefore, that intermediate climates are more favourable for human happiness than either extremes; but whether such as are at all times temperate, as those of many parts of Italy and Spain, or such as are alternately temperate and severe, as those of the south of Germany and the north of France, are the best, may perhaps be doubted. It appears that a climate where the winters are severe, has a considerable influence on the human character, by the necessity which it induces of forethought, in the laying up a provision of food for winter, and the greater attention and labour that are requisite in the article of clothing for that season. It is certain, on the other hand, that, in climates at all times temperate, the health, other circumstances being alike, must be better than in severe climates, where it is impaired by the artificial atmosphere of apartments during the winter season; and constant good health must necessarily have a considerable influence on the character. Supposing, therefore, all the artificial circumstances to be the same in two climates, such as that of the south of Germany, and that of Italy or the central parts of France, it seems reasonable to conclude that man would attain to a higher degree of perfection in the latter climates than in the former. So much for our theory of the influence of soil and climate on man; and, for further details, we refer the reader to Dr. Falconar's work on the subject (Bath, 4to, 1788?).

Of all the artificial or accidental circumstances which influence the character, personal education must be allowed to be the greatest, and, next, religion and government. Manner of life, occupations, and pursuits, and even amusements, have an important influence. To do more than premise these matters, would be unsuitable to this Magazine; but what has been said became necessary as an introduction to what is to follow.

Applying the above theory to the three states of Germany which we have passed through, Wurtemberg, Bavaria, and Baden, the climate and soil of these states seem favourable in the second degree; education, to a certain extent, is there universal; religion is, on the whole, more simple than in some other countries; and the laws and governments seem, at least, equal, in constitutional merits and impartial administration, to those of any people in Europe. The manner of life, or occupation, is chiefly agricultural; which, though not favourable to luxury and refinement, seems, without doubt, for the great mass of the people, the happiest mode of existence. Local and personal attachments are universally felt to be essential sources of happiness; and in no way can this feeling be gratified so easily and effectually as by the possession of land. In the three countries named, the great majority of the population are occupiers in perpetuity, of a portion of the soil, either as absolute proprietors or as perpetual renters. This state of things is far from being favourable to what is called making money; but it is highly favourable to health and contentment. It is a great deal for a poor man to have something which he can call his own; something on which he can bestow labour, and from which he can, in consequence, extract enjoyment. The absolute necessities of life are few, and derived directly from the soil; the labouring man, therefore, who has a house and a few roods of land, is certain of a home and food; he increases the interest of his home by a wife; and parental care and solicitude, with connubial and filial attachment, fill up the measure of his happiness. These are the essential purposes and enjoyments of life, which nature intended for all men; which the poor man can enjoy as well as the rich; and for which no other enjoyment, either of the rich or the poor, the wise or the learned, can entirely compensate. In no part of Europe have we seen, or thought we have seen, these enjoyments so generally diffused as in the countries we have recently passed through, and more especially Wurtemberg. We entered on these countries, expecting to find the people not much better off than in France; but we could not resist the conviction, produced by constant observation, and the result of various enquiry, that comfort and happiness exist to a much greater degree among the labouring classes of society in the south of Germany, than they do in Britain. The people, at first sight, have a milder and more civilised aspect. The dress of the country labourers, male and female, does not consist of such fine materials as in England; but one part of the dress is of a quality consistent with the others, and the whole is in a superior style, compared with the dress of the other classes of society. There is no such thing, in this part of Germany, as a man or woman in rags, or with a coat or gown of the best quality, and the hat or stockings in tatters, as is frequently the case, not only among labourers, but even among mechanics, in England. In short, the dress in Germany is in much better keeping. Both men and women of the labouring class here are more intelligent in their aspect, much more civil and polite on a first acquaintance, and much better furnished with conversation, than the British labourers. What struck us particularly were, the great rarity of exceptions to this general description, the general uniformity of manner and character throughout the whole country, and the total absence of public beggars. On enquiry, we found that there were few or no poor supported publicly, though every parish is obliged to support its poor when unable to work; and, also, that there were very few people in prison, either for debt or for crime of any kind.

This state of things more particularly applies to Wurtemberg; and the causes, we think, may be very easily traced. The first and principal cause is a law respecting schools, which has existed, more or less, in the states of the south of Germany, for above a century, but which has been greatly improved within the last thirty years. By this law, parents are compelled to send their children to school, from the age of six to fourteen years, where they must be taught reading, writing, and arithmetic, but where they may acquire as much additional instruction in other branches as their parents choose to pay for. To many of the schools of Bavaria large gardens are attached, in which the boys are taught the principal operations of agriculture and gardening in their hours of play; and, in all the schools of the three states, the girls, in addition to the same instruction as the boys, are taught knitting, sewing, embroidery, &c. It is the duty of the police and priest (which may be considered equivalent to our parish vestries) of each commune or parish, to see that the law is duly executed, the children sent regularly, and instructed duly. If the parents are partially or wholly unable to pay for their children, the commune makes up the deficiency. Religion is taught by the priest of the village or hamlet; and where, as is frequently the case in Wurtemberg, there are two or three religions in one parish, each child is taught by the priest of its parents; all of which priests are, from their office, members of the committee or vestry of the commune. The priest or priests of the parish have the regular inspection of the schoolmaster, and are required by the government to see that he does his duty, while each priest, at the same time, sees that the children of his flock attend regularly. After the child has been the appointed number of years at school, it receives from the schoolmaster, and the priest of the religion to which it belongs, a certificate, without which it cannot procure employment. To employ any person under twenty-one, without such a certificate, is illegal, and punished by a fixed fine, as is almost every other offence in this part of Germany; and the fines are never remitted, which makes punishment always certain. The schoolmaster is paid much in the same way as in Scotland; by a house, a garden, and sometimes a field, and by a small salary from the parish; and by fixed rates for the children.

A second law, which is coeval with the school law, renders it illegal for any young man to marry before he is twenty-five, or any young woman before she is eighteen; and a young man, at whatever age he wishes to marry, must show, to the police and the priest of the commune where he resides, that he is able, and has the prospect, to provide for a wife and family.

There are minor causes, but these two laws, and the general possession of land both by labourers and tradesmen, are the chief. Amongst the minor causes are the general simplicity of their forms of religion, and universal toleration; even the Catholic faith, in Wurtemberg, is unattended with the ceremony and spectacle with which it is exhibited in various parts of Germany and France. The equal footing on which the different religions are placed, is also favourable to liberality of sentiment and good neighbourhood. That particular mildness of feature and character, so different from what is met with in the labouring classes in England, is, no doubt, partly owing to the greater proportions of vegetables and fruits which enter into the general diet of the population; the almost total abstinence from strong liquors or spirits, the general drink being wine; and, perhaps, to the almost unremitted smoking of tobacco from morning to night.

If we seem to have wandered a little from our direct path, in order to bring these particulars into the view of our readers, it is because we think similar laws, in respect to education and marriage, would be of the greatest importance to Britain and Ireland. Nothing could be easier than for every vestry and parish clergyman to see them executed. Such laws would be a small infringement, it is true, on personal liberty; but an infringement which, we should think, every reasonable parent would assent to, and for which, we are sure, every child, on its arrival at the age of maturity, would be thankful. We most ardently wish that the state of things in the three countries mentioned, might attract the attention of some person of parliamentary interest; and that those who have doubts on the subject, would consent to inform themselves by a residence of a few weeks in Wurtemberg, and especially at Stuttgard, round which city will be found one of the richest and most picturesque countries in Europe. If we have made any mistakes in this hurried relation, written without leisure to refer to the documents which we have in our portmanteau, M. Zoller, one of the Commissioners of National Schools, and our principal informant, will correct us, or supply our omissions. — *Cond.*

ITALY.

Flòra Virgiliàna. — Sprengel of Halle, and Martin of London, have endeavoured to ascertain the identity of the plants mentioned by Virgil; and, more recently, M. Fée of Paris, was employed upon the same subject by the editor of the *Latin Classics;* but Sig. Tenore of Naples, has not only had the advantage of their remarks, but has travelled over Italy with his *Virgil* in his hand, and has just published the result in a *brochure* entitled *Osservazioni sulla Flora Virgiliana.* He only mentions eleven. 1. The *A*rúndo of Virgil is not necessarily the *A*rúndo *D*ònax, nor the *A. P*hragmìtes, as M. Fée decides; for Italy possesses other species of *A*rúndo. 2. The *B*áccar is not the *Valeriàna* céltica, as M. Fée thinks, but rather the *A'*sarum. 3. The

Cerínthe must be either the *S*aturèja *T*hŷmbra, or *S.* capitàta. 4. The *C*ùcumis of the line

" Cresceret in ventrem," &c.

is not the common cucumber, but the *C*ùcumis Chàte of Linnæus, a plant originally brought from Egypt, by the conquerors of the world. As to the *C*ùcumis cærùleus of Virgil, Sig. Tenore thinks it must be the *Melone vernico* of the Italians. 5. The *Æ*'sculus is, without doubt, the *Q*uércus *R*òbur var. latifòlia, and not the *Q*uércus *Æ*'sculus, of which the existence in the Flora of Virgil is doubtful. 6. The *H*édera álba is not the *A*ntirrhìnum Asarìna, a common plant in the South of France, but which is not found in the Neapolitan territory. It must be that variety of *H*édera called by Pliny *C*hrysocárpum. 7. The *H*yacínthus is not the *L*ílium *Mártagon.* It accords better with *G*ladìolus byzantìnus. 8. The *O*leáster is not the *E*leágnus angustifòlia, or Bohemian olive, which never grew spontaneously in Italy, but the wild olive at present known all over the south of Italy by the name of *Olivastro.* 9. The Cèrea prìma belong to the variety named by the Italians *Scaldatelle.* 10. The *R*osèta is the cultivated rose. 11. The *V*ibúrnum is not the Lantàna, but the *V*ibúrnum *T*ìnus. (*Bulletin des Sciences.*)

Flòra Clássica. — Dr. J. Billerbeck is publishing, under this title, descriptions of all the plants mentioned in classic authors, with the original passages in which they are mentioned. (*Announc. Scient. de Götting.*, p. 479.)

DENMARK.

Erratic Boulders and Blocks. — The huge blocks of granite and other primary rocks, which are found scattered over plains and ravines at a great distance from any rocks of the same species, whence they could have been detached, have long been a subject of interesting study and speculation to geologists; and numerous facts connected with their phenomena may be found in the papers of De Luc, Saussure, Von Buch, Hausmann, and Sedgewick, of which a brief summary, along with some original facts, may be found in the *Conversations on Geology*, p. 257. To these facts we have to add an excellent paper, by M. Brongniart, in the *Annales des Sciences Naturelles* for May, on the rock blocks of Sweden. The author agrees with Hausmann and Von Buch, in tracing the erratic blocks which are scattered over the plains of Seeland, Holstein, and the southern shores of the Baltic, to the table lands (plateaux) of Scandinavia. Their size is frequently enormous, and they abound in the sandy plains of Holstein, still more in that of Seeland, and in the vicinity of Copenhagen, even to Elsineur. They furnish, indeed, the only building stones in those districts. It was at first supposed that they must have come from the Hartz mountains, the nearest district of granite *in situ*, but more minute inspection proved their identity with the rocks of Sweden, particularly in the minerals contained in them such as wernerite, and in the calcareous blocks, trilobites, and orthoceratites, as M. Brongniart proved. The greatest difficulty of explaining the transit of these blocks is the Sound, which, though narrow, is very deep; and it does not appear in what manner they could have cleared it, as they continue to be found in Scania the same as in Seeland. A similar difficulty is presented by the deep valley of the Aar, with respect to the blocks of Mount Jura. They are so abundant in some places, as to form a sort of hill, which the Swedes call *ose*, or *sand-osar*, according to the predominance of blocks or of sand. These M. Brongniart found more particularly in Scania, Smoland, Sundermania, and Upland. They are seldom high, and usually long and narrow in form, being rather larger, and more elevated at one extremity than another, and sometimes interrupted towards the middle with a tranverse ravine. They maintain a constant direction from N.N.E. to S.S.W., extending to considerable distances, and very nearly in parallel lines. M. Brongniart aptly compares them to the little mounds of sand or gravel formed in streams of running water, when interrupted by a large stone, or any other obstacle. One *ose*, in particular, named Kinnekulle, and situated on the shore of the Lake Wenern, at the foot of a plateau of basalt, is composed of sand and black coloured blocks, in form of a cue from north to south. Here the origin of these blocks is obvious; for they consist of the same basalt as the plateau, from which they have been detached, and transported to different distances. Upon the plateau of Kinnekulle there are many blocks of granite of considerable size, and also similar masses of the inferior sandstone, presenting a striking example of primary rocks, placed upon rocks of newer formation, and also upon alluvial soil of more recent origin.

M. Brongniart remarked, that both in Sweden and in many sub-Alpine and sub-Apennine hills, in proportion as the transported blocks are nearer the summit they increase in size. Thus, in going towards the summit of Superga, near Turin, the blocks at the bottom of the hill are little more than boulders; towards the middle they are several pounds' weight, while near the top they are large. A British instance, no less striking, of the same fact, may be seen in *Conversations on Geology*, p. 122.

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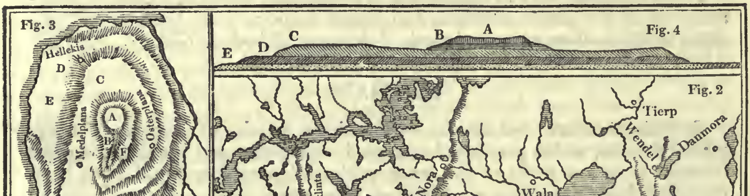

DESCRIPTION.

Fig. 1. View of a hill of sand, covered with erratic blocks, on the confines of Scania and Smoland.

Fig. 2. Reduced copy from Hermelin's map of Sweden, to show by pointed tracks the direction of the long, narrow, sand hills, covered with erratic blocks, N. and W. of Upsal.

Fig. 3. and 4. Chart and section of the mountain Kinnekulle, on the east bank of the Lake Wenern.

A, Plateau of compact pyroxenous basanite, very like dolerite. This plateau is depressed in the centre, and contains a marsh.

B, Slaty marl, with some vegetable impressions, and the small bodies named graptolites, by Linnæus.
C, Compact limestone, brownish, yellowish, and greenish, containing trilobites, orthoceratites, &c.
D, Aluminous ampelite, containing trilobites, paradoxites and agnostes.
E, Inferior sandstone, containing doubtful vegetable impressions.
F, Sand and basalt.
G, Gneiss.

ASIA.

Fishes peculiar to certain Lakes. — Several travellers confirm the account given by Josephus (*Antiq.* iii. 18. and *De Bello Jud.*, &c.), that the fishes of the Lake of Gennesareth are peculiar to it. Hasselquist says, " I thought it remarkable, that the same kind of fish should here be met with as in the Nile, such as Charmuth, *S*ilùrus, Boenni, Mulsil, and *S*pàrus galilæ'us. Josephus says that some consider the fountain of Capernaum as a vein of the Nile, because it brings forth fishes resembling the *C*orácinus of the Alexandrine Lake.

Supposed Change of Climate. — Professor Schouw, of Copenhagen, has argued plausibly against the opinion, that certain climates have changed in the lapse of ages. The date tree, for instance, he says, requires a mean temperature of 78° Fahr., to bring its fruit to perfection; and it is as successfully cultivated in Palestine now as it was in the earliest times, of which he gives interesting notices. Jericho was called Palm town; and Deborah's palm tree was mentioned between Rama and Bethel. Pliny mentions the palm tree as being frequent in Judea, and chiefly about Jericho. Tacitus, Josephus, Strabo, Diodorus Siculus, and Theophrastus, all speak of woods of palm trees there; and on the Hebrew coins date trees are by no means rare, and are easily recognised by their fruit. (*Oken's Isis.*)

Coral Pólypi. — MM. Quoy and Gaimard, the naturalists of the Astrolabe, in her late voyage of discovery, paid considerable attention to the habits of the numerous *P*ólypi inhabiting corals and corallines, and have thrown some light on their history. They always found, on examining with attention, that the *P*ólypi protruded only a very little their lamellar and fringed tentacula (les etoiles lamelleuses et decoupées) from their abode, a circumstance which gives them a very peculiar appearance. In some Millepòræ, the animals are very obvious, though in others they cannot be seen; but on passing the hand along the surface, the touch does not indicate the feeling of an immediately stony basis. In some, no organic substance can be perceived, the surface being rough and dry, as the most arid limestone; but in others, such as the elk's-horn, though similarly rough and dry, very minute *P*ólypi, can be detected burrowing in the stony matter. It may be remarked, that touching those *P*ólypi produces the same stinging sensation, followed by redness, as that produced by certain Medùs*æ*, which has obtained for them the name of sea-nettles. The sting of the *P*ólypi, it would appear, is produced by some acrid fluid, for it is communicable from the hands to any other part of the skin.

MM. Quoy and Gaimard could find no trace of animation in the substances called Nullipòræ, by Lamarck, from their exhibiting no perceptible pores. They profess entire ignorance of their manner of growth.

Corals and corallines of recent formation are much more porous and fragile than when of some age; because the interstices, in the former case, have not been filled up, and even the parts which have been formed require exposure to the air to consolidate and harden them.

No *P*ólypi appear to possess, as has by some been supposed, life or animation in common. If they did, they would enjoy, as M. Lamarck shrewdly observes, qualities repugnant to the nature of every known animal, namely the faculty of never dying. The stars and rosettes of the *P*ólypi, therefore, however numerous, and however closely contiguous, have no mutual communication, nor continuity of substance; the only evidence indeed of which is the instantaneous and simultaneous retreat by the *Pólypi* into their cells, when accidentally disturbed.

It has been supposed by some naturalists, and is universally believed by the negroes, that fish are rendered poisonous by feeding on the coral *Pólypi*; but MM. Quoy and Gaimard argue, that the flat obtuse nose of fishes cannot possibly detach the *Pólypi* from their encasements. In the instance of fish which have jaws strong enough to break coral, such as the Dìodon cærùleus, whose stomach they found filled with fragments of Madrepòræ, no nation is known to eat them. In the Mariannes they are looked upon with disgust.

NORTH AMERICA.

Impressions on Rocks. — About two miles south of Brasstown, in the United States of America, there is a mountain which is called the Enchanted Mountain, celebrated for the curious impressions, resembling the tracks of turkeys, bears, horses, and human beings, found on its rocky surface, as perfect as they could be made on snow or sand. (*Lon. Gen. Gazetteer.*) It is probable that these appearances are much indebted to the imaginations of the describers. — *J. R.*

Description of the Passenger Pigeon. — Length from tip of the bill to the oil-bag $8\frac{8}{10}$ in.; to the end of the tail $8=16\frac{8}{10}$ in. Breadth $24\frac{1}{2}$ in. Weight 9 oz. Bill an inch, black, lengthened, slender; nasal scale wrinkled; a slight flexure in the line of the gape immediately under the nostrils. Upper mandible longer than the under and bent downwards, with the rudiments of a notch; symphysis of the lower mandible short sub-ascending, slightly prominent retrally, with a shallow mesial groove; inside of the mouth livid. Tongue blunt. Bare place round the eyes livid. Irides reddish orange. Feet reddish, paler behind than before. Tarsus $1\frac{1}{10}$ in.; the middle toe, exclusive of the nail, the same; claws black, arched, and grooved below. Chin, cheeks, head, back, and rump, bluish grey; shoulders with yellowish brown. Side of the neck and behind, reddish purple, iridescent. Fore neck deep chestnut, becoming paler on the breast, or rather salmon-coloured, and passing to white on the belly and vent, thighs like the breast. Quills brownish black, the grey column of the margin of the outer web increasing at the base of the secondaries, and towards the ends of the inner ones. Bastard wing and greater covers of the primaries brownish black; greater covers of the secondaries grey. Lesser covers and outer scapulars tinged with yellowish brown, with black spots. The second quill the longest, the first and fourth equal, but these not at full growth. Tail of twelve feathers, the two middle produced, the rest decreasing to the exterior. The two middle dusky black, the next grey, the inner margin white towards the extremity, with a black and brown spot near the base; the fourth and third grey, with the black and brown spot. The outer web and tip of the first white, lower half of the inner web grey, with a black and brown spot. The upper tail-covers long, produced; the lower ones white. (*Dr. Fleming.*)

SOUTH AMERICA.

Magellanic Clouds. — In the sixth or eighth degree of south latitude, the phenomenon called the Magellanic clouds is visible. These supposed clouds are three in number, one black and two white. At the first sight they may be mistaken for clouds; but their being stationary, and their appearance when attentively viewed, show that they are not genuine clouds. The black one is only a spot in a galaxy, in which there are very few visible stars, and, being surrounded by a milky whiteness, shows much darker than the other parts of the sky. The other two white ones are only clusters of small stars, which emit a hining whiteness like the galaxy. They appear nearly as in the following figure: — A, the galaxy; B, the black spot; C and D, white ditto.

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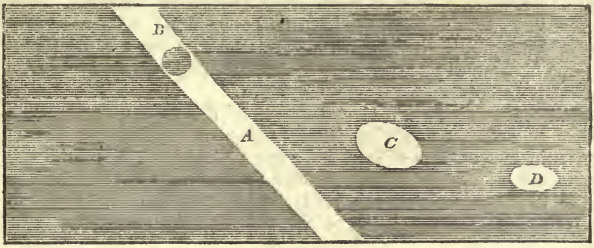

Mount Sorata. — From the observations of Mr. Pentland it appears that the Nevado de Sorata is the highest mountain in America. It is situated towards the northern prolongation of the eastern Cordillera, and almost in the centre of a group of snow-covered pics. Its latitude is 15° 30′ south, and it is to the east of the large village of Sorata inhabited by native Peruvians. Mr. Pentland has determined its height to be 25,200 feet, by means of trigonometrical observations taken on the shores of the lake Titicaca, compared with the usual limits of perpetual snow in this climate, namely, 17,100 ft.

It is composed of transition slate in which porphyritic syenite abounds, traversed by auriferous veins, from which particles of gold are washed down into the streams which run into the Rio Beni, that runs through the celebrated El Dorado.

Mr. Pentland announces that he will publish, in a few months, the detail of his observations upon this and the other mountains of the Andes, as well as his researches into the history, antiquities, geography, and natural history of Bolivia, or Upper Peru. (*Annales des Sciences*, xiv. 299.)

Mount Illimani. — The Nevados de Illimani, the second American mountain in point of altitude, is situated in the province of Paz, in Bolivia, or Upper Peru, and twenty marine leagues south-east of the city of Paz. It is farther south than any of the other snowy pics of the eastern Cordilleras; and, according to the astronomical observations taken near its northern base by Mr. Pentland, it is situated between 15° 35′, and 16° 40′ south latitude, and between 67° and 68° west longitude. Its summit forms a ridge traversed by four pics in a line parallel to the axis of the chain, and lying north and south. The most northern of these pics is 24,200, and the most southern appeared to Mr. Pentland still higher, but he has not yet determined the exact difference.

The mountain is composed of grauwacké or transition slate, the beds of which are often separated by strata of quartz rock and flinty slate. These are associated with porphyritic syenite and true granite veins, beds, or stratified masses. The transition slate is traversed by numerous veins of vitreous quartz, containing particles of native gold or auriferous pyrites. Some of these veins, at the height of 16,000 ft., appear to have been explored by the ancient Peruvians.

Captain Basil Hall, it appears, has objected to the statements of Mr. Pentland that Illimani cannot be seen from the sea, forgetting that it is 310 geographical miles from the coast, and could not there be seen.

AUSTRALIA.

Land Crabs. — In the forests of Guam, more than a mile from the shore, MM. Quoy and Gaimard found a very large species of *P*agùra, with violet claws, lodged in the shells of *B*úccina, and covered with an earthy crust, which appears to be their constant abode. Some of these *P*agùræ had the faculty of emitting a sort of froth when they were irritated. They were attracted by light; for one night, when encamped on shore, the sailors lighted a fire, and a large *P*agùra came towards it from a considerable distance, and became the victim of his curiosity, being cooked in his own house, and afterwards devoured.

It appears that there are two divisions of this tribe; one living on land, the other in water; the marine species being distinguished by rounded eyes, set upon the extremities of long cylindric peduncles. The land species, on the approach of danger, always retreat, either into accidental crevices or holes, or preferably under the roots or into the hollow trunks of trees; never, or, at least, rarely, into the sea, though it be near them.

Art. II. *Natural History in the English Counties.*

LIVERPOOL Botanic Garden.—A clever sketch of the origin, rise, progress, and present state of this establishment is given in the *Albion*, a Liverpool newspaper, for June 4. 1827, from which we make the following extract: —

" The garden was laid out, about twelve years ago, under the auspices of several gentlemen, amongst whom was the venerable and gifted Mr. Roscoe, and its success has fully equalled the most sanguine expectations. It comprises five acres of land, and is well enclosed by a stone wall, which is overtopped by a thriving hedge, giving it at once privacy and shelter. The ground narrows towards the north, and terminates in the frontage formed by the gate, and two plain lodges on each side of it. The visitor, after surveying the monotony of the surrounding fields, which are barren and mossy, is agreeably surprised to find himself embowered, on entering within the inner gate, in shady walks skirted by the choicest ornamental shrubs and trees. On leaving this pleasure-ground, which is laid out with much taste, and contains an extensive rockery, in which, amongst many curious specimens of stones and minerals, are seen a fragment of the Giant's Causeway, the conservatory presents itself, an erection of great magnitude and elegance of structure (*fig.* 203.), extending across nearly the whole breadth of the ground, and sheltered, at the back, by a row of black Italian poplars. The middle apartment of this splendid range is the most lofty, and projects with a semicircular front, supported by four handsome Ionic columns. At each end is a similar projecting apartment, on a smaller scale and less elaborate in style. From the latter, spacious walks run southward to the bottom of the garden, which also terminates in a delightful pleasure-ground, variegated by beautiful shrubs, amongst which are observed the copper beech, the scarlet thorn, the snow-drop tree, and numbers of tribes of rhododendrons, and every choice shrub which will flourish in the open air. This ground embraces also the angle at the southwest corner, formed by the widening of the ground to the south; the main portion, for the culture of fine flowers, being embraced in a square, running parallel with the east wall. Nothing can be better contrived upon the allotted space than the windings of the walks in the pleasure-ground, the margins of which are closely carpeted with grass, affording a variety of occasional glades or recesses.

'Where, all unseen, the cavalier
May pour his love in maiden's ear,
And kiss the hand he loves so dear,'

"The main portion of the garden is divided, by luxuriant hedges of privet and beech intermixed, into eight sheltering compartments, in which are arranged, after the system of Linnæus, the several classes of plants. The neat and appropriate manner in which these are laid out in beds, intersected by minor walks, and affording, at each progressing step of the visitor, new objects of admiration, can only be estimated by inspection. Suffice it here to state, that the collection is copious, and comprises all the rare tribes and varieties in every class of Linnæus, beginning with the second and ending with the twenty-fourth. The health and vigour of the plants, numbers of which are delicate to rear, 'bearing,' as they do in their alternate seasons, 'their blushing honours thick upon them,' is the highest testimonial of the taste and liberality of the proprietors, and of the skill of Mr. Shepherd, the superintendent botanist. Their several tribes and species are distinctly labeled on small white boards, thus affording to the botanical student the utmost facility in his researches. In the borders the shrubs and flowers are placed, indiscriminately, in a pleasing variety; and the attention of the lounger is often arrested to examine some hitherto unobserved, beautiful, or extraordinary relative of the numerous family of Flora. The collection also embraces many varieties of mosses, and creeping shrubs, and grasses; and we never beheld richer specimens of the Pæòn*ia* and the genus *D*elphínium.

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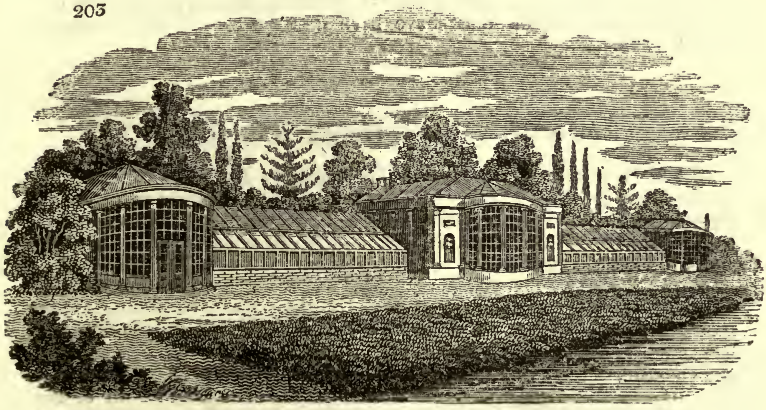

"We now return to the conservatory. In front is a spacious walk, on each side of which are placed commodious garden seats. Close to this, and between it and the main compartments of the garden to the south, is a rich grass-plot, decorated with shrubs and trees at each end, and in the middle beautified by an extensive oval pond, full of pure water, and partially overgrown with the yellow and white water-lily, the bulrush, and other rarer aquatic plants. The enchantment of this delightful little sheet of water is such, that it is found necessary to encircle a considerable space round its margin with an almost invisible wire fence, to prevent the banks from being trodden in. The pond abounds with the silver and gold fish, which, at this season, when they are about casting their scales, are either purely scarlet or gold coloured, white and glittering like silver, or present a motley appearance of both. Here are also tench and carp (some of the former two or three pounds' weight) living in harmony with their feebler but more beautiful finny brethren; and all are so much accustomed to be fed with bread by the ladies who visit them, that they exhibit no shyness at the approach of strangers, and, swimming to the edge, seem to implore a crumb or two from every passer by. The conservatory is divided into five compartments or chambers, of which the three in the middle are maintained at a high temperature for East and West Indian, South American, and South Sea Island productions. The two at the extremities are reserved for the finer plants, which are affected only by the sharpness of the winter, and are, at this season, nearly stripped of their inmates, which are deposited in a warm recess behind the building, formed of a thick enclosure of hedging."

Accidental Preservation of Hen's Egg Shells. — As some workmen were employed in repairing a part of the building of the New Inn, Gloucester, in removing a lead spout, they discovered a hen's nest, containing eleven eggs, which must have been deposited there about two centuries ago! The shells of the eggs were perfect, but of a very dark colour, and the inside quite dried up. (*Cheltenham Chronicle*, Feb.)

Coleopterous Insects driven from their Winter Quarters. — The marshes and low meadows about Bungay were flooded for several days in January last, and the water was as high as had been known for some years. This produced a very singular spectacle on the 19th and 20th of that month; but especially on the 19th, when, from the rushing down of the waters, the insects, chiefly coleopterous, were driven from their winter quarters, and being washed to the land, had taken refuge by crawling up the posts by the side of Earsham dam, adjoining the town, and in such numbers as to be truly astonishing. I have no doubt from the quantity which I saw floating on the water, but myriads must have been destroyed. — *D. S. Bungay, March,* 1828.

Art. III. *Natural History in Scotland.*

Mineral Waters. — Dr. Thomas Thomson, the distinguished Professor of Chemistry in the University of Glasgow, has just published an excellent memoir on the mineral springs of Scotland, in the *Glasgow Medical Journal*, now on our table, from which we shall abridge his remarks on the sulphureous and chalybeate waters.

Moffat Water. — The village of Moffat lies at the bottom of a range of transition hills, consisting of greywacké, transition green stone, and transition slate; and, though Dr. Thomson did not observe any alum slate, he thinks it not improbable that the spring originates in it; but the rocks in the vicinity are so covered with soil, as to preclude examination. Dr. Garnett, who resided for a summer at Moffat, found that a wine-gallon of the water contained 36 grains of common salt, 10 cubic inches of sulphuretted hydrogen; 4 cubic inches of azotic gas, and 5 cubic inches of carbonic acid gas. Dr. Thomson found the constituents of an imperial gallon to be as follows: —

Sulphuretted hydrogen gas	21·290 cubic inches.
Common salt	176·569 grains.
Sulphate of soda	16·562
Sulphate of lime	11·579
Sulphate of magnesia	5·474
	210·184

Strathpeffer Water. — These wells are situated in the valley of Strathpeffer, near Dingwall, in Ross-shire. The spring seems to originate in the new red sandstone, and not far from Ben Wevis, one of the most conspicuous mountains in the north of Scotland. When the temperature of the air was 60°, Dr. Thomson found that of one of the springs 39° and of the other 39¾°. The upper well was obviously the strongest, and had a smell of sulphuretted hydrogen gas, with a specific gravity of 1·00193. The imperial gallon was found to contain

Sulphuretted hydrogen gas	26·167 cubic inches.
Sulphate of soda	67·770 grains.
Sulphate of lime	39·454
Common salt	24·728
Sulphate of magnesia	6·242
	138·194

Hartfell Spaw. — This spring arises from the base of Hartfell, about five miles from the village of Moffat. The water is quite transparent, and free from smell; the taste sweetish, and astringent; the specific gravity 1·0007. Dr. Garnett says, the rock from which it originates possesses the characters of alum slate. One thousand grains of the water contain

Sulphuric acid	0·276 grains.
Muriatic acid	0·269
Protoxide of iron	0·306
Lime	0·291
	1·142

Second Moffat Chalybeate. — This water is described as running in considerable quantity down the face of a mountain. It is of a red colour, and of a harsh, astringent, chalybeate taste, having a specific gravity of 1·00965. It reddens vegetable blues. An imperial gallon contains

Sulphuric acid	437·559 grains.
Peroxide of iron	236·410
Alumina	34·984
	708·953

Diluvial Remains. — Among a collection of fossils and other curiosities, in the possession of Mr. David Buist, land-surveyor, Perth, is the lower jaw-bone of a shark, with the teeth entire and in good preservation, found below the surface of the ground, in the inland part of the county of Perth. Mr. Buist is silent as to the locality, expecting yet to find some other remains of the skeleton near the place. (*Dundee Courier*, May 9th.)

Art. IV. *Natural History in Ireland.*

Rare Bird. — It is now above 20 years since, in visiting my friend Mr. Lane at Roxton, I found him in his garden endeavouring to shoot a strange bird, which had, for several days previous, been making sad havoc among his cherries. After two or three unsuccessful attempts on the part of Mr. Lane, the bird at last fell to my barrel. It was about the size of a starling, and resembled that bird in its manner of standing and flying, more than any bird I am acquainted with. The tail was, I think, rather longer, and more like that of a blackbird. The head, and down half the neck, save the bill, which was yellow, and a large tuft of feathers on the crown, the colour of the back; the wings and the tail were a beautiful, glossy, jet black; the back, breast, and belly (the latter somewhat lighter) were the colour of the Royston crow, but beautifully speckled all over, at regular distances, about 1 in. apart, with three small bright red spots placed equidistantly in triangles, not in regular lines, but becoming more crowded towards the neck. The tuft on the head was of the same ash colour as the body, but I am uncertain whether this was also speckled or not. This tuft the bird seemed to have the power of raising at pleasure. Its cry resembled that of the water ouzel, and its legs and feet those of the starling. It was quite a *rara avis* in this country, no one knowing anything of it; nor could any description of it be found in Buffon, Goldsmith, Mavor, or Bewick. Whether this bird was a strayed exotic, or a variety or mule of any indigenous species, I am not sufficiently acquainted with natural history to say. Mule birds, even in their wild state, are sometimes met with. I once saw a perfectly white starling among a flock of them, by the road-side; and a nearly white hen-sparrow, for several years, had her nest within 20 yards of my bed-room window.

This strange cherry-bird was given, for the purpose of being preserved in the Dublin Museum, to Mr. Healy Dutton, who happened to be in the neighbourhood, collecting materials for his statistical survey of the county, at the time it was killed. Whether it was preserved and lodged in the museum or not, I have never learned, nor indeed have I ever enquired; but I should think, from even the imperfect description given above, it might, if in existence, be identified: at any rate, my account may call the attention of some ornithologist, who may be pleased to give his opinion as to what this stranger really was. — *Charles Adams Drew. Ennis, June* 25. 1828.

Art. V. *Calendar of Nature for London.*

The remarkably mild and open weather which has prevailed since our last report, has been attended with its usual consequences, viz. late vegetable productions, as flowers, &c., rarely seen in the months of November and December.

Early flowers, as the primrose, polyanthus, and Christmas rose, are already in bloom. The song-thrush frequently, and the redbreast constantly, singing.

Many insects still swarm under hedges; and the blind beetle (Geotrúpes stercoràrius) is seen on wing every evening.

The weather, since our last, has only been varied by two or three frosty nights in the early part of November, and a storm of thunder about the 8th instant. — *J. M. Dec.* 23. 1828.

Art. VI. *Indicatorial Calendar.*

The two ensuing months, as the first of the year, are full of promise, by presenting, on sheltered spots, the opening buds and peeping flowers. If the weather be severe, there will be but few attractions for the naturalist. The entomologist, however, may detect the Hýphydrus ovàtus, the Colymbètes bipunctàtus, and the *N*èpa cinèrea, in ponds or ditches; the Salpíngus *r*óboris, Coccinélla humeràlis, and Drômius quadrimaculàtus, under the bark of trees; and, perhaps, may meet with the Geómetra primària and brumària moths in hedges. — *J. M. Dec.* 23. 1828.

Art. VII. *Queries and Answers.*

The Heather-bluiter of the Scotch (p. 297.) is the common bittern, mire-drum, or marsh-boomer (*A'*rdea stellàris *Linn.*); and the sound of the bird is so very common, that every child is familiar with it, though the birds, from being shy, are not often seen. The poet Thomson seems to have had a very erroneous notion of the manner in which the bird produces the noise, when he says,

> ——— "So that scarce
> The bittern knows his time, with bill engulpht,
> To shake the sounding marsh." *Seasons.*

On the contrary, I have repeatedly remarked that the bittern usually booms while flying high in the air. Its lofty spiral flight, indeed, is a matter of common remark.

> "Swift as the bittern soars on spiral wing." *Southey.*

A line which, I may remark, is not very ornithological; inasmuch as neither the bittern, nor any other bird, has spiral wings. Southey, however, seems to be well acquainted with the boom of the bittern.

> ——— "At evening, over the swampy plain,
> The bittern's boom came far." *Thalaba.* *J. Rennie.*

Edible Lizards. (p. 391.) — Is not a large species of lizard eaten, and reckoned a delicacy, in Jamaica? — *M.* [Yes; the fact is well known. — *J. R.*]

Búlla lignària. — Sir, Will you favour me, in one of your succeeding Numbers, with a few remarks upon the gizzard of the Búlla lignària. I am anxious to know whether the inhabitant of this shell is endowed with any peculiar digestive power, or whether this organ may be met with in any other species of shell fish. A little information on this subject will greatly oblige, Sir, &c. — *C. S. July* 18. 1828.

Parrots in Van Diemen's Land. — A friend, residing in Van Diemen's Land, has asked me if I can suggest any means of preventing parrots from destroying seed when first sown; and I ask you or any of your correspondents. — *A Subscriber. London, August* 11. 1828.

Organisation of Plants. — I take a great interest in the physiology of botany, and have often lamented the insufficiency of microscopes to enable me to ascertain the organisation of plants From a number of the *Library of Useful Knowledge,* I learn that this enquiry is facilitated, by plunging the parts to be examined in a phial of nitric acid, placing the phial in boiling water, and keeping it at the boiling point for 12 or 15 minutes. I have tried this, but cannot succeed; the contents of the phial, when taken out, were merely the acid, and a portion of pulp totally disorganised, and in a state of effervescence that would admit of no examination, had there been anything to examine. I tried it with half the boiling, but, even then, the parts were one confused mass, from which nothing could be understood. Can you give me any information about this; or, if not, will you put a query to that effect in the Magazine? — *E. K. August* 3. 1828.

Art. VIII. *Retrospective Criticism.*

Food of the Lapwing. — Under Art. Zoology, p. 374., on the mistakes of instinct in animals, it is said that "the lapwing, when it cannot find a sufficiency of slugs, pats the ground with its feet, to bring forth earthworms." That the lapwing devours slugs is enough to propitiate the farmers in favour of the bird, however averse they may be from the land they frequent. I have often tried to discover what the food of these birds was, but never could be satisfied on this point. Within the last month I desired a gamekeeper (Nash, gamekeeper to G. Farley, Esq., Crowle House, Worcestershire) to shoot a couple, out of hundreds which frequented a field of fallow then sowing with wheat. I saw them opened. The gizzard contained small stones, and morsels of green vegetable matter. The vessel which the gamekeeper called the trail, was charged with a thick mucus, in which were small stones, pieces of the élytra of small beetles, and seeds of some species of *Polýgonum*; but no slugs (though the field swarmed with them), earthworms, wheat (of eating which the birds were accused by the bailiff), nor any other matter which could be distinguished.

I have often observed that the lapwing finds some part of its food a little way below the surface of the ground, as the moist sides of the furrows are full of perforations made with their bills. At the same time, I have noticed very little hills of fine earth, resembling those of the little ground bee, thrown up out of round cavities or cells, each of which contains the larva of some insect of the beetle tribe, as they are in colour like those of the ladybird, but in shape and size very like the Lepísma saccharìna. These larva, I suspected, might be the prey of the lapwing; but this I never could determine. — *M.*

Foreign Migratory Birds. (p. 376.) — On the notice respecting the introduction of foreign or migratory song birds, J. R. seems to doubt whether redbreasts would take to strange eggs, because, he says, "they *readily* forsake their own, if touched." J. R. ought to have known, that, though redbreasts, as well as other birds, will forsake their eggs and nests, if disturbed in the early part of the season, or while they are laying, they seldom do so after they *have* begun to sit. Mr. Anderson only stated facts. — *M.*

J. R., in reply to these remarks, professes his ignorance of the circumstance that birds seldom forsake their nests after beginning to sit, and is certain of many particular facts authorising a contrary opinion. Many birds will forsake their young, much more their eggs, of which the domestic pigeon is a well-known example.

Biography of J. Templeton, Esq. (p. 403.) — Sir, The biography of the late Mr. Templeton, which has been commenced in the last Number of the Magazine of Natural History was not written by me. This I stated to you before, a circumstance, which, in consequence, I suppose, of the manuscript coming through my hands, had been overlooked. It is the composition of the Rev. Thos. D. Hincks, M.R.I.A., and Principal of the Classical Department of the Belfast Institution. Mr. Hincks was, when he read the paper, President of the Belfast Natural History Society, but on account of a multiplicity of engagements, he resigned that office, and I was elected to it. The very interesting account of our late excellent naturalist, has been given by Mr. Hincks in such a way as might be looked for from one of his long acknowledged talents and extensive erudition, and is much superior to any thing I could have produced on the subject. I therefore request that you will publish this note in your next, and alter the heading of the article in your continuations of Mr. Templeton's life. By so doing, you will much oblige your constant wellwisher. — *Jas. L. Drummond. Belfast, Dec. 6. 1828.*

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END OF THE FIRST VOLUME.

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