

naked spores (sporiferous, in contradistinction to sporidiferous) at the apex of simple or branched threads. It promises to contain much valuable information. Other interesting papers are by Dr. Braithwaite, on the Geographical Distribution of Mosses; M. de Erebysson, on French Diatomaceæ; and Mr. B. T. Lowne, on the Cornea of the Bee.

THE *Journal of the Ethnological Society* for April contains a valuable report by Lieut. Oliver, R.A., illustrated by several very beautiful lithographs, on the present state and condition of Pre-historic Remains in the Channel Islands. Notwithstanding the wholesale and wanton destruction of these monuments in the Channel Islands within the last half-century, there are nevertheless few localities, Brittany excepted, in which the sepulchral stone structures of the neolithic period can be studied with greater advantage. Lieut. Oliver describes in detail the monuments still remaining in Guernsey, Herm, Serk, Jersey, and Alderney; and notes the remarkable resemblance borne by them to the monoliths and stone tombs of Madagascar, erected by the hill-tribes of Hovas even at this very day. Mr. C. T. Gardner contributes an essay on the Chinese Race, their Language, Government, Social Institutions, and Religion; Mr. G. Busk, a description of, and remarks upon, an ancient *Calvaria* from China, which had been supposed to be that of Confucius; and Mr. H. H. Howorth, a continuation of his article on the Western Drifting of Nomades, from the fifth to the nineteenth century.

Geological Magazine, vol. vii. No. 4, April 1870.—This number opens with the first of a series of notices of eminent living geologists, and the editor's choice has worthily fallen upon the veteran Professor Sedgwick. Professor Huxley has a paper, illustrated with a plate, on the milk-dentition of *Palæotherium magnum*. From Professor Rupert Jones we have a series of notes on the Tertiary Entomostraca, containing supplementary remarks and corrections to his monograph of those minute fossils published by the Palæontographical Society in 1856, and including a revised list of the species. The other papers are, an article on the superficial deposits of Belgium, illustrated with a map prepared by Mr. H. M. Jenkins for his paper on Belgian agriculture, published by the Agricultural Society; a notice of the Basaltic Rocks of the Midland Coal-fields, by Mr. S. Allport; a note on the Middle Drift-beds in Cheshire, by Mr. J. E. Taylor; and an extract from a letter of Mr. F. B. Meek to Dr. Bigsby, giving an account of the fossils found in some silver-bearing rocks near Central Nevada, which appear to be of Devonian age. The number contains the usual notices, reviews, reports, and miscellaneous matter.

THE *Revue des Cours Scientifiques* for April 9th is occupied by a sketch of the biological labours of the late Prof. Sars, by Emile Blanchard; a translation of Mr. Andrews' paper, read before the Royal Society, on the continuity of the liquid and gaseous states of matter. The number for April 16th contains a translation of the Anniversary Address before the Hunterian Society by H. J. Fotherby; and a report of a lecture by Claude Bernard on Blood and its General Properties.

IN the *Monthly Microscopical Journal* for April we find a description (with illustrations) by Dr. Carpenter of some peculiar fish's ova, the peculiarities having reference to the shape of the ova, the mode of their attachment to the surface of the shell, and the position and remarkable distinctness of the micropyle; and a description (with plate), by Mr. C. A. Barrett, of a new tube-dwelling stentor, found on a piece of weed taken from the Thames at Moultsford; an article on the polymorphic character of the products of development of *Monas lens*, by M. Johnson, with others of less importance.

THE *Zeitschrift der Gesellschaft für Erdkunde zu Berlin*, vol. 5, section 1, contains several very interesting papers of travel. An Ascent of the Peak of Teneriffe, by E. Häckel, Sketches of a Journey from Chartum to the Gazelle River, by G. Schweinfurth, both these articles being abundantly full of valuable natural-historical details; a report of the Western-Australian Expedition, by Mr. Forrest, in search of traces of Leichardt; an account of Dr. Nachtigall's Journey to Tibesti, and other shorter articles.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, April 7.—“On supraannual cycles of temperature in the earth's surface-crust.” By Prof. C. Piazzi Smyth, F.R.S. The author presents and discusses here the completely re-

duced observations, from 1837 to 1869 inclusive, of the four great earth-thermometers sunk into the rock of the Calton Hill, at the Royal Observatory, Edinburgh, by the late Principal Forbes, pursuant to a vote by the British Association for the Advancement of Science. Leaving on one side the several Natural-Philosophy data which have been investigated from smaller portions of the same series of observations both by Principal Forbes and Sir William Thomson, the author applies himself solely to trace the existence of other cycles than the ordinary annual one, in the rise and fall of the different thermometers. Of such cycles, and of more than one year's duration, he considers that he has discovered three; and of these the most marked has a period of 11.1 years, or practically the same as Schwabe's numbers for new groups of solar spots. Several numerical circumstances, however, which the author details, show that the sun-spots cannot be the actual cause of the observed waves of terrestrial temperature, and he suggests what may be; concluding with two examples of the practical use to which a knowledge of the temperature cycles, as observed, may at once be turned, no matter to what cosmical origin their existence may be owing.

“On the Constituent Minerals of the Granites of Scotland, as compared with those of Donegal.” By the Rev. Samuel Haughton, M.D., Dubl., D.C.L. Oxon., Fellow of Trinity College, Dublin. This paper contains analysis of Orthoclase from the following localities:—

No. 1. Stirling Hill, Peterhead. Occurs in an eruptive Granite, in veins, in well-developed reddish pink opaque crystals, encrusted with crystals of Albite.—No. 2. Rubislaw, Aberdeen. Large beautiful reddish pink opaque crystals, in veins, associated with white Mica. The Granite of Rubislaw is of metamorphic origin, and different in character from the eruptive Granite of Peterhead. No Albite has been found in it.—No. 3. Peterculter, Aberdeen. In Metamorphic Granite; white, translucent, large crystals.—No. 4. Callernish, extreme west of Lewis. In Metamorphic Granite; in large grey crystals, with a slight shade of pink, translucent.—The Granites of central and western Scotland are metamorphic rocks, like those of Donegal and Norway, with which they are geologically identical; and truly eruptive Granite occurs at only a few localities, as, for example, near Peterhead. The second felspar, associated with Orthoclase in the Metamorphic Granites, is Oligoclase, as in Donegal; while the second felspar associated with Orthoclase in the eruptive Granites, is Albite, as in Mourne, Leinster, and Cornwall. The fact thus indicated by the Scotch Granites is completely in accordance with the mode of occurrence of Oligoclase and Albite in the Irish Granites. (Then follow analyses of two Oligoclases.)—No. 1. This Oligoclase occurs in the Granite of Craigie Buckler, near Aberdeen; it is white and opaque, and so much resembles Cleavelandite in appearance as to have been mistaken for that variety of Albite; its analysis proves it to be Oligoclase. The crystals do not exhibit striation.—No. 2. From the Granite of Rhiconich, in the west of Sutherlandshire; it is greyish white, semitranslucent, in large striated crystals, and resembles the Oligoclase of Ytterby, in Sweden.—Analysis of an Albite which occurs at Stirling Hill, near Peterhead, in eruptive Granite, and is found associated with red Orthoclase in veins. It encrusts the large crystals of Orthoclase, and is semitranslucent; and is generally stained on the surface by peroxide of iron. This mineral is evidently a typical albite. There are two kinds of mica found in the Scotch granites, and both micas resemble very closely the corresponding minerals of the Donegal granites. The specimen of mica analysed came from veins in the granite quarry of Rubislaw, near Aberdeen, and occurs in large plates, associated with red orthoclase. It was carefully examined for lithia, but no trace of this alkali could be found in it. The angles of the rhombic plates were 60° and 120° exactly, and the angle between its optic axes was found to be 70° 30'. The black mica, in large crystals, is very rare, but it seems abundantly disseminated, in minute scales, through most of the Scotch granites. An analysis was made on specimens found near Aberdeen by Professor Nicol, and kindly forwarded to me by him, for the purposes of this paper. This mica was carefully examined for fluorine, and found not to contain any.

Researches on Vanadium. Part III.—Preliminary Notice. By Henry E. Roscoe, B.A., F.R.S.—I.—Metallic Vanadium.—11.—Vanadium and Bromine.—1.—Vanadium Tribromide, VBr_3 , molec. wt. = 291.3.—2.—Vanadium Oxytribromide, or Vanadyl Tribromide, $VOBr_3$, molec. wt. = 307.3.—The specific

gravity of the oxytribromide at 0° is 2.967.—3.—Vanadium Oxydibromide, or Vanadyl Dibromide, VOBr_2 , molec. wt. = 227.3.—III.—Vanadium and Iodine.—Iodine-vapour does not attack either the trioxide or the nitride at a red heat, both these substances remain unchanged, and no trace of vanadium can be detected in the iodine which has passed over them.—IV.—The Metallic Vanadates.—Sodium Vanadates.—1.—Ortho- or Trisodium Vanadate, $\text{Na}_3 \text{VO}_4 + 16\text{H}_2 \text{O}$.—2.—Tetrasodium Vanadate, $\text{Na}_4 \text{V}_2 \text{O}_7 + 18\text{H}_2 \text{O}$.—Lead Vanadates.—1.—Tribasic or Ortho-Lead Vanadate, $\text{Pb}_3 2(\text{VO}_4)$.—2.—Vanadinite, the Double Orthovanadate and Chloride of Lead, $3\text{Pb}_3 \text{VO}_4 + \text{Pb C}_2$.—3.—Basic Dilead Vanadate, $2(\text{Pb}_2 \text{V}_3 \text{O}_7) + \text{Pb O}$.—Silver Vanadates.—1.—The Ortho-silver Vanadate, $\text{Ag}_3 \text{VO}_4$.—2.—The Tetrabasic Silver Vanadate, $\text{Ag}_4 \text{P}_2 \text{O}_7$.

Anthropological Society, April 5.—Captain Bedford Pim, R.N., V.P., in the chair. A paper, by Mr. Hodder M. Westropp, was read, on Phallic Worship. The author, after asserting the spontaneity and independence of certain beliefs and superstitions in the human mind, at all times and in all climates, proceeded to trace out the rise and development of phallic worship as one of the most ancient of those religions that have extensively prevailed among various sections of the human race. In the earlier ages the operations of nature made stronger impressions on the mind of man than in the later periods of his history. There were two causes which must have engaged the attention of the savage observer of nature, the generative and the productive, the active and passive. The author then described what he conceived to have been the process of thought, founded on analogies from the observation of the great forces of nature by the Egyptians, Assyrians, Hindus, Chinese, Phœnicians, Greeks, Romans, the aborigines of America, Australasia, and Polynesia, and on the unquestioned evidence of phallic worship in its various phases belonging to those peoples. That worship was always, among the ancients, of a purely reverential kind, and partook of nothing obscene, either in its teaching or its observance; it was a homage paid to the most potent and most mysterious of the powers of nature.—Mr. C. Staniland Wake then read a paper on the Influence of the Phallic idea in the Religions of Antiquity.

Chemical Society, April 7.—Prof. Williamson, president, in the chair. The following gentlemen were elected Fellows:—F. Andrews, jun., W. Martindale, and A. H. Palmer.—Dr. Divers concluded a paper, commenced in a previous meeting, "On the combination of carbonic acid with ammonia and water." The elaborate and very extensive memoir does not permit of any convenient abbreviation.—Dr. Gladstone communicated a paper "On the refraction equivalents of the aromatic hydrocarbons, and their derivatives." In a previous paper it was shown that the refraction values of organic compounds may easily be calculated when the refraction equivalents of the constituent bodies are known. The present paper enumerates a large number of substances which do not conform to the rule. The so-called aromatic hydrocarbons give, by experiment, higher figures than required by calculation. Dr. Gladstone accounts for this anomaly by regarding the nucleus phenyl, $\text{C}_6 \text{H}_5$, as an entity having, like some elements (for instance, iron and phosphorus), the peculiarity of changing its refraction value.—Mr. Hunter, of Belfast, communicated a paper "On Deep-Sea waters," a sequel to a note read before the society in December last.—Messrs. Bolas and Gloves read a note "On Bromopicrin" and announced also the discovery of tetrabromide of carbon.—Prof. How, of Nova Scotia, reports of a feed water occurring at Stellarton, N.S., which contains traces of free oil of vitriol.—For the meeting on April 21st a lecture "On Vanadium," by Prof. Roscoe, is announced.

Ethnological Society, April 12.—Professor Huxley F.R.S., president, in the chair. It was announced that Dr. Bonavia had been elected a member of the Society; Dr. Carl Semper, of Würzburg, an honorary foreign member; and Lieutenant S. P. Oliver, R.A., a corresponding member.—An interesting paper by Hodder M. Westropp, Esq., described very fully the ancient tribal system and land tenure in Ireland under the Brehon laws, and gave rise to a spirited discussion which was sustained by Mr. G. Campbell, Colonel Lane Fox, the president, Dr. Hyde Clarke, and Mr. McLennan.—A communication was then read "On the Danish Element in the population of Cleveland in Yorkshire." The author pointed out that not only many words in the Cleveland dialect and a very large proportion of personal and local names in the district are of Scandinavian origin, but also that many of the idioms in use are

markedly Scandinavian. He also sought to trace an old Anglian element in the population. Mr. Jón. Hjaltalin (an Icelandic,) Dr. Hyde Clarke, the Rev. Dr. Nicholas, and Col. Lane Fox, took part in the discussion which followed the reading of this valuable communication.

Entomological Society, April 4.—Mr. Alfred R. Wallace, F.Z.S., &c., president, in the chair. Exhibitions were made of *Colcoptera* by Mr. Jenner Weir and Mr. Janson; of *Lepidoptera* by Mr. Jenner Weir and Mr. Howard Vaughan; of *Hymenoptera* by Mr. F. Smith; and *Orthoptera* by the secretary.—The ravages committed in granaries by *Calandra granaria* and *C. oryzae*, and the means of preventing the same, were the subject of a lengthy discussion, in which Messrs. Jenner Weir, Vogan, Janson, Westwood, McLachlan, F. Smith, and the president took part.—Mr. Albert Müller read a note on the odour of certain *Cynipidae*, and Mr. G. R. Crotch communicated some observations on British species of *Dasytidae*.

BIRMINGHAM

Natural History Society.—Geological Section.—A paper on the Igneous Rocks of the Midland Coalfields was read by Mr. S. Allport, F.G.S. The author had examined carefully the mineral constitution of the igneous rocks of the Shropshire, Staffordshire, and Warwickshire coalfields, and also the so-called loadstone of Derbyshire, and was of opinion that they all belonged to the carboniferous age, and in the case of the traps of the coalfields he had no doubt the said traps were contemporaneous and not intrusive. These rocks, now found in patches over the several coalfields of the Midlands were probably all derived from one source, just as the coalfields themselves were probably only remnants of a coalfield of great extent. In conclusion the author made some reference to the nomenclature of igneous rocks, which he said at present was in a very unsatisfactory state.

CAMBRIDGE

Philosophical Society, March 21.—Communications made to the society: 1. By Mr. Röhrs (Jesus College) "On carmine and the colouring principles of cochineal." The author described the process which he had followed in some experiments in making carmine. He found that the presence of carbonate of lime in the water used was essential to success. The hard and shelly (Mexican) cochineal, of a colour inclining to foxy red, made the best carmine. Whitening was a most important ingredient in the process. He then discussed the theory of this, and inferred that two colouring principles existed in cochineal—purpureo-carminic and coccineo-carminic acid, whereof the latter was unstable.—2. By Mr. Lewis (Corpus Christi College), "On a Roman Lanx and other antiques found at Welney." The lanx was found about four feet below the surface. It was a specimen of the flat dish bearing this name, which often was of great size. Pliny mentions one weighing 500lbs. The metal of that exhibited (according to an analysis made by Prof. Liveing) was 80 per cent. tin, 18.5 per cent. lead. In the centre was an elaborate pattern in a circle, with letters at equal distances in angles of the pattern. This had been read "VTERE FELIX." The reading, however, was doubtful. The author then commented upon other antiques of bronze, stone, and horn, from the same neighbourhood.

DERRY

Natural History and Philosophical Society, March 4.—William Harte, C.E., F.R.G.S.I., president, in the chair. Mr. Harte communicated some observations on a remarkable meteor which passed over Donegal on the night of the 27th of December last; also a notice of a beautiful Aurora Borealis.—Mr. C. W. Dugan, M.A., read a paper on the "Gold Antiquities of Ireland," illustrated by drawings. In this paper he endeavoured to controvert some views adverse to the very early civilisation of Ireland; also some opinions advanced as to the source of gold from which the massive and gorgeous ornaments brought under notice had been fashioned. In connection with this paper there were exhibited some specimens of Irish ring money, &c., as also some splendid amber beads found on the property of Dr. Forsythe, and now in his possession.—Mr. Harte exhibited and made a few observations upon some beautiful cinerary urns found at Grange, near Strabane, and at Malins, Donegal. It is remarkable that a large urn and a small one were found together. These specimens are in good preservation. The black burnt ashes were adhering quite fresh to the sides of one of them.

EDINBURGH

Scottish Meteorological Society, March 30.—Admiral Sir William Ramsay in the chair. Dr. Keith Johnston read a paper "On the temperature of the Gulf Stream in the North Atlantic Ocean." He began by saying that he had read a paper on the Gulf Stream at the half-yearly meeting of the society in January 1862, which embodied the results of observations made in the Iceland seas by Captain Irminger, of Denmark. That paper attracted the attention of meteorologists, and the result was that new stations had been established by the society in Iceland and the Faroe Islands, each of them supplied with the best instruments, placed at the disposal of the council by the Board of Trade. The Meteorological Institute of Norway has, during the past three years, made observations of the temperature of the sea at the lighthouses round the coast as far north as $71^{\circ} 6'$ lat. N., and on board ships engaged in the Arctic fisheries. From these observations, together with those made at different stations off the Scottish coast, in Faroe, and in Iceland, Professor Mohn of Christiania, has just published a memoir on the temperature of this part of the Atlantic, illustrated by five charts for the four seasons of the year. The five charts exhibited were based on Professor Mohn's. The singular distribution of the temperature of the sea between Iceland, Scotland, and Norway must, as M. Mohn observes, be regarded as the best representation of the course and the extent of the Gulf Stream in these parts. The line designated as the thermal axis indicates the direction of the principal axis of the current. It is along this axis that the warm waters of the Gulf Stream are pushed forward by the current to the latitude of the North Cape and Spitzbergen. At the same time, the water is cooled as it advances, either from the effect of latitude or from the loss of heat experienced on both sides in beating the coast of Norway and in melting the ice of the sea between Greenland and Spitzbergen. The distribution of temperature during the summer months, being dominated by the solar heat, the isotherms of the sea have a greater tendency to follow the parallels of latitude. The thermal axis is, as it were, thrown on the shores of Norway, where it may be followed to the west coast of Spitzbergen and Nova Zembla. The distance of the thermal axis of the Gulf Stream from the west coast of Norway being not more than 125 miles, its effect on the climate of that country must be very remarkable. Thus we find that the west coast during winter has a temperature of the air which surpasses by from 4° to 5° that due to corresponding latitudes, if there were no current of warm water. On the shores of Norway round to the frontiers of Russia, the current of the sea is directed generally towards the north and east; and, carried by the current to this far northern region, products of the vegetable kingdom are often found which had their origin in the West Indies—a fact which proves beyond all question the existence of a north-eastern branch of the Gulf Stream thus far into the Arctic Ocean. Mr. Buchan said that, to illustrate the effect of winds upon the currents, he had looked into the question of the temperature of the air at various stations as compared with that of the sea. Over the whole of Scotland and as far west at least as Faroe, the winds were south-west in winter, there being very few easterly or north-easterly winds. In Iceland a different state of things prevailed, the mean direction of the wind being east-north-east. On the west coast of Norway, the prevailing direction was uniformly south-east, or south-south-east, that is to say the winds blow to a considerable extent off the land, where at that season the temperature is exceedingly low. In summer the winds in Iceland continue easterly, with some nothing in them; but in the north of Scotland they prevail more from the west. On the coast of Norway, the summer winds take the opposite direction to those prevailing in winter. The same holds good in the south and north of Norway, where the difference was 4° in favour of the sea.—Mr. Buchan read a paper on the cold weather of May 1869. Mr. Buchan said the temperature of Scotland during May 1869, was $45^{\circ} 1'$, which was $4^{\circ} 7'$ below the average of May in the past thirteen years, and $2\frac{1}{2}^{\circ}$ lower than any previous May recorded.

Royal Society, March 21.—Prof. Kelland in the chair. Dr. Keith Johnston communicated a paper by Mr. Keith Johnston, jun., on the "Lake Region of Eastern Africa." See abstract of this paper in NATURE, No. 24, p. 607.

Royal Physical Society, March 23.—Professor Duns, D.D., president, in the chair. The following communications were read:—On *Crocodylus biporcatus* (Cuvier), the Muggar. By Professor Duns, New College, Note on the Capture of the

Grey Seal (*Halichoerus grypus*) in the Firth of Tay. By Professor Turner. Note on the Preservation of Minute Animals in Acetic Acid. By T. Stretthill Wright, M.D. Notice of an instance of Double or Vertical Hermaphroditism in a Cod Fish (*Gadus morrhua*). By John Alex. Smith, M.D.

Botanical Society, March 10.—Sir Walter Elliot, president, in the chair. On the Formation of a Museum of Vegetable Materia Medica. By William Craig, M.B. and C.M. On the Fructification of *Griffithsia corallina*, with a notice of the other *Algae* found in Shetland, not mentioned in Edmonston's Flora. By C. W. Peach, A.L.S. On Two New British Hepaticae. By Dr. B. Carrington. On the occurrence of *Luuzula arcuata* and *Buxbaumia indusiata*, in Inverness-shire. By Dr. Buchanan White. On some recent Additions made to the Flora of Canada. By Mr. Sadler. Report on the Open-air Vegetation at the Royal Botanic Gardens. By Mr. M'Nab.

GLASGOW

Natural History Society, April 5.—Prof. J. Young, M.D., president, in the chair. The following papers were read:—1. "On shell mounds at the Machar Grogary, South Uist," by James A. Mahony. This paper was illustrated by a large collection of objects, chiefly shells of various kinds, bones of a number of animals, some of them drilled with holes, others split longitudinally, stone knives or scrapers, pieces of rude pottery, and other articles of a like nature, usually found in these refuse heaps. At the close of the paper, Prof. Young dwelt at some length in comparing these Hebridean mounds with what had been examined in the Eastern counties, especially in Caithness. 2. "On the sea anemones of the shores of the Cumbraes," by David Robertson, F.G.S. The author gave a complete list of the species taken by himself in that most interesting locality, and exhibited several living anemones in illustration of his paper.

MANCHESTER

Literary and Philosophical Society, April 5.—Dr. J. P. Joule, F.R.S., president, in the chair.—"Description of a New Anemometer," by Mr. Peter Hart. It consists first of a base board furnished with levels and levelling screws; to this is hinged the board carrying the U tube, which may be called the sloping base; on this sloping base is secured the U tube furnished with a scale and vernier capable of being read to the $\frac{1}{100}$ inch. By means of a screw passing through the sloping base, and resting on the lower base board, the former can be made to assume any angle with the latter, the angle being determined by a quadrant fixed to the lowest base board.

Mr. W. Boyd Dawkins, F.R.S., described the results of the preliminary investigation undertaken by the Settle Cave Exploration Committee. Mr. W. L. Dickinson read a paper "On the Eclipse of the Sun, Dec. 21—22." A paper was also read "On the Influence of Changes in the character of the Seasons upon the Rate of Mortality," by Joseph Baxendell, F.R.A.S.

PARIS

Academy of Sciences, April 11.—A memoir, by M. C. Antoin on screw propellers, was presented by M. Laugier. The author examined the two main questions relating to the employment of the screw-propeller, viz., the number of turns obtained by means of a given motive power, and the advance made by the vessel for each turn of the screw.—M. Cahours presented a note by M. L. Daniel, on the action of magnetism upon two currents passing simultaneously through rarefied gases. The author found that when the currents are passing in opposite directions magnetism separates them even in capillary parts of the tubes; when they are in the same direction, they are attracted or repelled like a single current. The magnetic properties of the gases have nothing to do with the condensation of the light by the magnet, which acts upon the current itself.—Notices of the Aurora Borealis of the 5th April were communicated:—From Angers by M. C. Dechanne, from Paris by M. Tremeschini, from Le Mans by M. Charault, from Louvain by M. Terby, from Auvers by M. Geslin, from Vendôme by M. Guereau, from Betz by M. Fortier-Garnier, from Rohrbach by M. Gramant, from St. Lo by M. Lepingard, and from Loget-sur-Seine by M. Lagoret.—A memoir by M. C. Flammarion on the law of the movement of rotation of the planets, was communicated by M. Delaunay. From his calculations the author deduced the following as the law of the diurnal rotation of the planets:—*The time of rotation of the planets is a function of their densities.*

The rotatory movement of the planets upon their axis is an application of gravitation to their respective densities, and is equal to the time of revolution of a satellite placed at a distance r , multiplied by a co-efficient of resistance representing the density of the planetary body, which is at the same time the square root of the relation of its weight to the centrifugal force. The squares of these co-efficients are equal to the cubes of the distances at which satellites would gravitate in the period of rotation of each planet, and the distance at which a synchronous satellite would gravitate round each planet is the cube root of the centrifugal force, and marks the theoretical limit of any atmosphere. By applying his law to the planets Uranus and Neptune, the author deduced a diurnal rotation of $10^h 40^m$ for the former, and of $10^h 58^m$ for the latter.—Facts towards the history of nitric acid by M. E. Bourgoïn, were communicated by M. Bussey. The author described the decomposition of nitric acid at different degrees of dilution by the galvanic current. He regarded the formula of nitric acid as $\text{NO}^5, 2 \text{H}^2\text{O}^2$. With the acid in a very diluted state, only hydrogen was evolved from the negative pole; as the strength of the solution was increased the hydrogen evolved reacted upon the nitric acid, and caused the production of ammonia, free nitrogen, deutoxide of nitrogen, and nitrous acid, according to circumstances. With 15 equivs. of water nitrous acid remains in solution.—M. H. Sainte Claire Deville presented a note by M. Deschamps, on the metallic tartrates, in which the author described the preparation and characters of a double tartrate of sesquioxide of manganese and potash, having the formula: $\text{Mn}^2\text{O}^3 \text{KO}, \text{C}^8\text{H}^4\text{O}^{19}, 4 \text{HO}$ —M. P. Duchartre read some observations on the turning of certain fungi. The author described a case in which numerous examples of an agaric (probably *Coprinus radicans*, Desmaz.) grew in perfect darkness from the bottom of a water tank, and consequently in a reversed position. They were all upon the southern portion of the tank, but their stems sloped towards the north, and in the mature examples were bent upwards at an angle towards their summits, so as to bring the head into its natural position with the hymeneal lamellæ downwards. The author cited also some experiments made with *Claviceps purpurea*, specimens of which placed in a reversed position curved upwards towards maturity, and thus brought their heads into the natural position. He considered these observations, especially the former, to be strongly opposed to the mechanical theories of the direction of growth in plants.—A note was read by M. H. Baillon, on the dissemination of the stones of *Dorstenia contrayerva*. The author noticed the structure of the fruit in *Dorstenia* and the allied plants, which he stated to consist of a number of small drupes. He stated that the parenchyma of each drupe is much more developed towards the base, and that the cells composing it acquire a great amount of elasticity, which, acting upon the stone when this is set free by the lesion of their upper part, projects it to a considerable distance.—M. Dumas in presenting M. Pasteur's great work on the diseases of silkworms, gave an excellent summary of its contents; and M. Guyon accompanied the presentation of his natural history of the chigoe (*Rhynchoprion penetrans*, Oken), with an elaborate analysis of the work.—M. Roulin communicated a note containing observations on the chigoe, supplementary to M. Guyon's remarks.—M. A. Duméril presented an account of the production of a white race of axolots at the menagerie of the Museum, with some remarks on the transformations of those batrachians. The white race of axolots has been established by breeding from ordinary females with an albino male, and again breeding from pale-coloured females thus produced with the same male. Some of the white individuals have undergone their complete transformation. The author stated that hitherto the transformed axolots (*Amblystoma*) have never propagated, and that an examination of their sexual organs showed ova and spermatozooids in plenty, but not in the perfect condition. The generative products seemed to have undergone an arrest of development at the metamorphosis.—A note by M. E. Duchemin was read, describing a singular cause of the death of carp in a piece of water at Montigny. The fish thrive in this water, but every spring a considerable number are found dead, and all these are blind. This blindness is ascribed by the author to the attacks of toads, which fix themselves upon the heads of the fish, and do not quit their hold even when taken out of the water. As remarked by the Secretary of the Academy, this habit of the toad has been long known.—M. C. Robin presented a note by M. Legros on the real origin of the secretory canals of the bile.—M. Guyon presented statistics of the cases of hydrophobia observed among Europeans in Algeria from

1830 to August 1851.—A note on the operation of artificial pupil, by M. Liebreich, with figures of an instrument employed in the operation, was communicated.—Of several other papers no particulars are given.

BRUSSELS

Royal Academy of Belgium, March 5.—The following papers were read:—1. On the Aurora Borealis in the months of January and February 1870, by M. A. Quetelet.—2. On commensalism in the animal kingdom, by M. P. J. Van Beneden. The author distinguishes under the name of commensalism those cases in which one animal lives upon another, but not at its expense. In the present paper he described some new examples of this phenomenon. On the authority of M. Alex. Agassiz, he noticed a *Lepidonotus* which lives near the mouth of *Asteracanthion ochraceus*, Brandt, a small *Clupea* which resides among the fringes of a Pelagian Medusa (*Dactylometa quinquecina*, A. Agass.), a species of Hirudinea which lives in a Beroid (*Manemioptis Leydii*), a *Philomedusa*, (named *Biccidium* by L. Agassiz) which haunts the buccal fringes of the great *Gauea arctica*, a *Hyperina* which infests the disc of the American *Aurelia*, and a *Planaria* (*P. angulata* Müll.) which attaches itself to the lower surface of the King Crab, near the base of the tail. M. Agassiz also states that the young *Comatulæ* like to affix themselves to the basal cirri of the adults. M. Van Beneden also noticed, on the authority of Risso, that the Fishing Frog (*Lophius*) lodges a species of Murænid (*Apterichthys oculata*) in its great branchial sac. He referred to the polype, which so generally coats specimens of *Hyalonema*, as furnishing an example of commensalism, and in connexion with *Hyalonema* as a Sponge reaffirmed his opinion that Sponges represent the polype type reduced to its simplest expression; a notion very like that which has lately been put forward by Hæckel.—3. Remarks on the equation $x^m - 1 = 0$, by M. E. Catalan.—4. Note on the nature of the sun, by M. G. Bernaerts, in which the author maintained that the sun consists of a gaseous nucleus covered with a thin, incandescent liquid layer and luminous clouds.—5. On the meteoric stone which fell at Saint Denis-Westrem, near Ghent, on the 7th June 1855, by Dr. Stanislas Meunier. The author stated that the material of this meteorite, of which a portion, weighing 723 grammes, was picked up, is identical with that of many others, including the meteorite of Lucé (1768), whence he proposes to call it *lucite*. He gave the analysis of another stone, which fell in the Lower Pyrenees in 1868, and remarked upon the occurrence of *lucite* in various brecciform meteorites, associated in some with an oolitic mass which he denominated *montrejite*, from the stone of Montrejeau (1859), and which, in other meteorites occurs alone. The author maintained that the formation of meteorites is due to the natural breaking up of larger celestial bodies at the close of their development, and that the moon is now approaching this stage of its existence.—6. On Bryonine, a new nitrogenous substance extracted from the roots of *Bryonia dioica*, by MM. L. de Koninck and P. Murgart.—This was described as of a very pale, yellow colour, crystallising from dilute alcohol in slightly flattened and irregularly intermixed needles, neutral, insoluble in cold water, potash, ammonia and dilute mineral acids, soluble in alcohol, ether, &c., and in glacial acetic acid, and concentrated sulphuric acid, with the last giving a blood-red solution. The formula was stated to be $\text{C}^{19} \text{H}^{16} \text{N}^2 \text{O}^9$.—7. Investigations on the embryogeny of the Crustacea, by Dr. E. Van Beneden.—In this paper the author described in detail the development of the genera *Anchorella*, *Lerneopoda*, *Brachiella* and *Hessia*, the last-named a new genus.—8. Discovery of a deposit of phosphate of lime beneath the town of Louvain, by Prof. G. Lambert. This bed was discovered in 1869, in boring an artesian well; it commenced at a depth of 105-50 mm., and was 5 mm. in thickness, containing nodules of phosphate of lime like those worked for manure in this country.

VIENNA

Imperial Academy of Sciences, Feb. 17 (continued from p. 618).—11. Prof. Brücke communicated the results of his investigations of the digestive products of the albuminous bodies.—12. Experimental investigation on the diffusion of the gases without porous septa by Prof. Loschmidt. The author had investigated the rapidity of diffusion of two gases superimposed in layers and in contact upon a horizontal plane. His experiments related to air and carbonic acid, carbonic acid and hydrogen, and hydrogen and oxygen. Their chief result is the law of the proportionality of the constants of diffusion with the

squares of the respective absolute temperatures.—13. Project for preliminary operations in connection with the transit of Venus in 1874, by Dr. G. Neumayer, in which the author discussed at considerable length the measures to be taken in the observation of that important phenomenon.—14. Prof. E. Ludwig noticed an investigation made by himself and Dr. C. Græbe upon some derivatives of naphthaline allied to the chinones.—In presenting the fourth part of Dr. Manzoni's "Bryozoi fossili Italiani," Prof. Reuss noticed its contents, which include the descriptions of twenty-four species of fossil *Chilostomatous Bryozoa*, partly from the pliocene of Calabria and Castellarquato and partly from the miocene of Turin, &c. Nine species are described as new. This part also contains a critical examination of all the Italian fossils of this class. The report of the observations made during February at the Central Institution for Meteorology and Terrestrial Magnetism was communicated.

Imperial Geological Institution, March 16.—M. C. Griesbach, in a letter dated Port Natal, January 3, 1870, relates that he found fossils in the sandstone of the Table mountain. On a journey into the Griqua-land, he discovered also a large series of very well-preserved fossils, which he thinks belong to the Tithonic series.—Baron O. Petrino, On the origin of the Löss. Researches in the territories of the Dniester, the Pruth, and the Sereth rivers have led the author to the following conclusions:—(1) The Löss is the product of slowly running rivers, deposited from the upper part of the mass of water which during inundations overflows the surrounding country; (2) the time of its formation begins with the end of the glacial period, and has continued up to the present day; (3) within the löss-deposits layers of different periods are, locally, easily to be distinguished. The old river terraces and banks of pebblestone and sand are the product of quicker running rivers, which excavate their bed more rapidly. They are contemporaneous with the löss-deposits.—Dr. Bunzel exhibited a series of fossil bones from the upper chalk formation of Grünbach, near Neunkirchen in Austria. They form one of the most interesting palæontological discoveries which we have met with in the last few years. Dr. Bunzel recognised among them remains from animals of the families of the *Crocodylians*, *Lacertilians*, *Dinosaurians*, and *Chelonians*. The *Lacertilians* are especially represented by a new genus very nearly allied to the gigantic *Mosasaurus* from Mästricht, which genus has received the name *Danubiosaurus*. To the *Dinosaurians* belongs a new species of *Iguanodon*, *I. Suessi* Bunz. A very peculiar type is indicated by a skull of a saurian, in many respects resembling that of a bird, which he has called *Struthiosaurus*.—Charles von Hauer, On the deposit of Potassium-salts at Kalusz (Galicia). They form a layer seventy feet thick. The whole mass contains on an average 15.5 per cent. potassium, and consists of a mixture of the mineral species, kainit, sylvin, and salt. The presence of sulphuric acid renders it more suitable for all industrial purposes than the well-known layer of Stassfurth, Prussia.—D. Stur has shown by an accurate examination of a large series of fossil plants, that the red sandstones of the Banat belong to the Permian (Dyas) formation, and that the coal-measures below it belong to the fifth or fern-zone (Geinitz) of the carboniferous formation.

Anthropological Society, March 22.—Prof. Bokitansky in the chair. Prof. Müller on the origin of the writing of the Malayan peoples. The author argued against the views defended especially by the English ethnologist, Crawfurd, the famous Malayan scholar, that the Malayan alphabets (the writing of the Battak, the Redschang, Lampong, Bugi, Makassar, and Tagulo peoples) are an independent invention. By the form of the single letters, as well as by the manner used to indicate the vowels, he proved that these alphabets originate from the old Indian writing which is to be found in the Buddhistic inscriptions. In connection with this question he spoke also of the origin of the Indian writing generally, and by a comparison of the old Indian with the Malayan alphabets, he comes to the conclusion that the Indian writing originated from an old Semitic alphabet. He remarked especially on the close relation between the language and the writing, and pointed out the progress which the people made by developing the writing with syllables (Silbenschrift) to a pure sound-writing (Lautschrift).—Franz v. Hauer offered to the society a large series of pre-historic archaeological objects found in different parts of the Austro-Hungarian monarchy. Of very high interest among them are stone (Obsidian) implements, recently discovered by H. Wolf in the environs of Tokaj (Hungary). They have been found in many different spots, partly actually on the surface, partly in

a particular stratum, covered with a bed eight feet thick of quicksand. The implements are not polished, they are accompanied by fragments of very rude vessels, by bones, and rarely by metal objects. The analysis of one of the latter, made by A. Patera, gave in 100 parts 63.75 silver, 32.5 copper, 2.0 tin, 0.125, gold, and traces of iron. The collection contains further perfectly well preserved rude vessels from Morovon near Pistyan in Hungary, fragments of similar vessels from Waitzen on the Danube, many objects from Olmütz, &c., Von Hauer remarked besides that all the remainder belong to the alluvial period, and that we have hitherto possessed very few indications of the existence of man in the diluvial (postpliocene) period in Austria. Count T. Wilczek dedicated to the society a sum of 2,000 flor. (200 l. sterl.) for excavations in the celebrated sepulchral field of Hallstatt, and for an exploration of the lakes of Upper Austria for pile-buildings.

DIARY

THURSDAY, APRIL 21.

LINNEAN SOCIETY, at 8.—On the Vertebrate Skeleton: Mr. St. George J. Mivart.
CHEMICAL SOCIETY, at 8.
NUMISMATIC SOCIETY, at 7.

FRIDAY, APRIL 22.

QUEKETT MICROSCOPICAL SOCIETY, at 8.

MONDAY, APRIL 25.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.
LONDON INSTITUTION, at 4.

TUESDAY, APRIL 26.

ROYAL INSTITUTION, at 3.—On Moral Philosophy: Prof. Blackie.
ETHNOLOGICAL SOCIETY, at 8.—On the Philosophy of Religion among the Lower Races of Mankind: Mr. E. B. Tylor.—On the Brain in the Study of Ethnology: Dr. Donavon.
SOCIETY OF ANTIQUARIES, at 2.—Anniversary Meeting.

WEDNESDAY, APRIL 27.

SOCIETY OF ARTS, at 8.
GEOLOGICAL SOCIETY, at 8.

THURSDAY, APRIL 28.

ROYAL INSTITUTION, at 3.—Electricity: Prof. Tyndall.
ROYAL SOCIETY, at 8.30.
ZOOLOGICAL SOCIETY, at 8.30.

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