

mencing April 6, and terminating October 5. There are fifteen excursions, of which fourteen are announced for Saturday afternoons, one whole day excursion, and one day excursion ending with the excursionists' annual dinner. The annual *soirée* of the club was held at University College on Friday evening, March 22, and was attended by about 1,200 persons.

Journal of the Chemical Society, February. — Dr. Armstrong contributes a paper "On the nitration products of the dichlorophenolsulphonic acids," being a continuation of his researches published in recent numbers of this journal. The next communication is on Eulyte and Dyslyte, by H. Bassett, being a re-examination of these bodies, which were briefly described by Baup in 1851. The third and last original communication is by Dr. Howard, "On Quinicine and Cinchonine and their salts." Some time since the author gave an account of an amorphous alkaloid from cinchona bark, the properties of which distinguished it from those already described. Further investigations, however, have shown that it is probably identical with quinicine, first obtained by Pasteur by the action of heat on quinine. The author finds that the quinicine obtained from quinine, and that obtained from quinoidine, are identical in their properties. Several salts of cinchonine have been prepared; there is considerable resemblance between them and the quinicine salts, although the former are somewhat more soluble. The same identity is observed between the cinchonines obtained from cinchonine and from cinchonidine as was observed in the case of quinicine. The action of these alkaloids on polarised light confirms the identity already mentioned. Thus, the quinicines prepared, either from quinine (which possesses a strong left-handed rotation), or from quinidine (which has a right-handed rotation), exhibit a feeble right-handed rotation, which, in each case, is almost identical. The abstracts of papers in foreign journals occupy seventy-pages, and, as usual, are of great interest.

Verhandlungen der k. k. geologischen Reichsanstalt zu Wien. Nos. 3 and 4. The articles in these numbers are for the most part of local interest; but we notice a short sketch of the geological structure of East Greenland by F. Toula—some of the fruits of the last German expedition—which will be read with interest. Literary and other notices, as usual, occupy considerable space in the proceedings.

The *Geological Magazine* for April 1872 (No. 94) opens with an excellent article from the pen of Mr. W. Davies, of the British Museum, on the rostral prolongations of the singular Liassic fish, described by Agassiz under the name of *Squaloraja polyspondyla*. The two projecting processes from the snout of this fish were regarded by Dr. Riley and Prof. Agassiz as forming a single rostrum; but Mr. Davies argues with justice that the upper one is really a cephalic spine analogous to that met with in a similar situation in the male *Chimæridæ*, and that it was employed, as by them, in conjunction with the elongated rostrum, for securely clasping the female. Mr. Davies refers to other points in the anatomy of this curious fish, which he illustrates with a large plate.—Prof. Dyer commences the description of some remains of coniferous plants from the lithographic stone of Solenhofen; the form here described is named by him *Araucarites Haberleinii*.—From Mr. Searles Wood, jun. we have a paper on the climate of the post-glacial period, and a reply to Mr. James Geikie's Correlation of the Scotch and English Glacial beds, whilst the last-mentioned author contributes a fifth paper on Changes of Climate during the Glacial epoch.—Some points in the Geology of the East Lothian coast, form the subject of a paper by Messrs. G. W. and F. M. Balfour, in which they describe the peculiar relations existing between the porphyrite of Whitberry Point and the adjacent sedimentary (sandstone) rocks, the latter being found to dip on all sides towards the mass of porphyrite. The authors suppose the porphyrite to have been erupted through a small orifice, and to have caused the depression of the sedimentary beds by pressure.

The original articles in the March number of the *American Naturalist* are not so numerous as usual. Prof. J. D. Biscoe commences with a description of the breathing-pores or stomates of leaves.—Prof. H. W. Parker describes the meteorological phenomena witnessed in the western prairies, including the very common occurrence of parhelia in mock suns.—Dr. R. H. Ward has some remarks on uniformity of nomenclature in regard to microscopical objectives and oculars, of considerable interest to microscopists.—The most important article is "On

the Stone Age in New Jersey," by Dr. Chas. C. Abbott, illustrated with a number of woodcuts of the rude implements and utensils found throughout that State, the relics of its original Indian inhabitants.

SOCIETIES AND ACADEMIES

LONDON

Geological Society, April 10.—"Notice of some of the Secondary Effects of the Earthquake of the 10th January, 1869, in Cachar." Communicated by Dr. Oldham, of Calcutta, with remarks by Mr. Robert Mallet, C.E., F.R.S. This earthquake was a severe one, being strongly felt in Calcutta, distant from the meizoseismic area about 200 miles, and far into the plain of Bengal. The effects were examined on the spot a few weeks after the shock by Dr. Oldham, who anticipates being able to fix the position and depth of the centre of impulse by following the same methods as those first employed by Mr. Mallet with respect to the great Neapolitan earthquake of 1857. These results have not yet been received; but Dr. Oldham has forwarded an extremely interesting letter on the circumstances of production of very large earth-fissures, and of the welling up of water from these, derived from the water-bearing ooze-bed, upon which reposed the deep-clay beds in which the fissures were formed. Dr. Oldham rightly views all these fissures, which were all nearly parallel to and not far distant from the steep river banks, as "secondary effects," and not due to fractures produced by the direct passage of the wave of shock. He also shows that the welling up or overflowing of the water in the fissures was a secondary effect also, and negatives the notion entertained on the spot of mud-volcanoes, &c., having originated at those fissures. The chief aim of Mr. Mallet's remarks was to point out the importance to geologists of rightly comprehending the dynamics of production of these phenomena, and to show that the older notions of geologists as to earthquake-fissures are untenable. He explained clearly, aided by diagrams, the train of forces by which the elastic wave of shock, on passing out of the deep-clay beds where these have a *free side* forming the steep river banks, dislodges certain portions and throws them off towards that free side—and that this is but a case of the general law in accordance with which such elastic waves behave towards more or less incoherent deposits reposing on inclined or on level beds, under various conditions. Mr. Mallet also explained the dynamic conditions under which the water from water-bearing beds, such as that of ooze beneath the Cachar clay beds, becomes elevated in the fissures formed, and gave approximate expressions for the minimum height to which the water can rise in relation to the velocity of the elastic wave particle. The paper concluded with some explanatory remarks upon the continual noises, like the irregular fire of distant artillery, heard long after the shock had passed, and when the country had become perfectly quiescent. The noble collection of photographs which were made by Dr. Oldham, and forwarded to Mr. Mallet, illustrative of the physical features of the huge earth-fissures and other effects of this earthquake, were exhibited to the Fellows present, and are well worthy of attentive study. Sir Henry James inquired whether there was any trace of fissuring in the lower beds beneath the slimy ooze. Mr. Scott wished to ascertain the author's opinion as to the possibility of predicting earthquakes on meteorological grounds, as had been done by M. Bouvard, several of whose prophecies were said to have been fulfilled. Mr. D. Forbes gave some details of the earthquake of Mendoza, a town situated on a vast alluvial plain at the foot of the Andes, in which the phenomena remarkably coincided with those detailed by Dr. Oldham. In that case he found that the rumours as to fire and smoke having been emitted from fissures were entirely without foundation, the presumed smoke having been nothing but dust. The earthquake was felt over a distance of 1,200 miles; and wherever the firm rock came to the surface there was no trace of fissure, though portions of the rock were overthrown. But in the plain, consisting of 30 or 40 feet of alluvial soil, the whole ground was in places fissured, and in some districts the surface completely furrowed, and even the turf turned over. He had witnessed numerous earthquakes, and in some cases had been in deep mines during their occurrence, when the sound only could be heard, and he could testify to their effects being confined to the surface. The direction of the fissures was invariably at right angles to the line of shock. In South America all the earth-

quakes could be traced to volcanic centres. The President inquired as to the distinction to be drawn between the primary and secondary effects of earthquakes, and whether the author thought that no fissures were attributable to the direct action of earthquakes. As to the cause of the sound, like that of a cart carrying iron bars or of an artillery waggon, he wished for further information. Mr. Mallet, in reply, explained that fissures only take place where masses were comparatively free in one direction. They might extend to enormous depths, though they often closed in rapidly. With regard to the power of predicting earthquakes, he disbelieved in it wholly, and considered that any fulfilment of such prophecies must be due to accident; earthquakes are so numerous, that the chances of such fulfilments are great. The blow or impulse originating earthquakes could not be attributed solely to one cause. It arose often from deep subterranean volcanic action; but it also—especially in the case of long-continued tremors, like those of Comrie or Pignerol—arose from the breaking up or the grinding over each other of rocky beds at a great depth, through the tangential pressures produced in the earth's crust by secular cooling. The arrested impulse of the fall of the Rosberg in Switzerland produced a sensible earthquake. Fissures in hard rock could not be produced directly by the shock, because the velocity of impulse in such rock greatly exceeded that of the elastic wave particle. The earth's crust was at present not in a state of tension, but of compression, through secular cooling.

Zoological Society, April 16.—Dr. E. Hamilton, vice-president, in the chair. A letter was read from Dr. R. Schomburgk, of the Botanic Gardens, Adelaide, South Australia, containing an account of the apparently reasonable conduct of a monkey kept in the gardens.—Mr. A. H. Garrod, Prosecutor to the Society, read a paper on the mechanism of the gizzard in birds, in which he endeavoured to show that the ordinary action of this organ was that of compression, and not of trituration as usually understood.—A communication was read from Dr. John Anderson, on a supposed new monkey from the Sunderbunds to the east of Calcutta, allied to *Maccacus rhesus*.—A communication was read from Mr. W. H. Hudson, containing remarks on the birds of the Rio Negro of Patagonia, as observed during a recent visit to that locality. To this was added an appendix, by Mr. Sclater, giving a scientific account of Mr. Hudson's collections.—A communication was read from Mr. R. Swinhoe, containing descriptions of two new pheasants (*Phasianus ellioti* and *Pucrasia darwini*) and a new *Garrulax* (*G. picticollis*) from the vicinity of Ningpo, China.—A paper by Mr. F. Moore was read containing the descriptions of a large number of new species of Indian Lepidoptera.—Mr. E. W. H. Holdsworth read notes on a Cetacean observed on the west coast of Ceylon, remarkable for possessing a long, straight dorsal fin, and known to the natives as the "Palmyra fish."—Dr. A. Günther read a paper on a collection of reptiles and amphibians made at Metang, in the district of Sarawak, Borneo; to which was added a synopsis of the known species of these classes hitherto recorded from that island. These were stated to be altogether 153 in number.—Sir Victor Brooke, Bart., gave a description of a supposed new species of gazelle from Ugogo in Eastern Africa, which he proposed to designate *Gazella granti*.

Linnean Society, April 18.—Mr. G. Bentham, president, in the chair. Mr. M. E. Grant-Duff, M. P., was elected a fellow.—The President announced the death of Prof. v. Mohl, one of the foreign members of the society.—Prof. Oliver described four new genera of plants recently received at the Kew Herbarium. 1. A new genus of Begoniaceæ, from New Grenada, of special interest, as the order at present consists only of the large genus *Begonia*, and another monotypic one from the Sandwich Isles. It resembles in habit the series of *Begonia* with thin membranous leaves not cordate at the base; but is very aberrant from the typical genus in possessing a single monophyllous perianth, and being monœcious, the male flowers possessing only four stamens, which are apparently didynamous, and give the plant an external resemblance to Gesneraceæ; the ovary, however, is that of typical *Begonia*. Prof. Oliver gives this new genus the name *Begoniella*. It does not appear to throw any light on the difficult affinities of the order. The three other genera are from Dr. Maingay's collection from the Malay Peninsula. The first is a new genus of Hamamelidæ, *Maingaya*, in which the calyx is perfectly closed in the bud, and afterwards ruptured. The order is of interest as going back at least to the Miocene period, and still existing in both hemispheres. The two other new genera belong to the order

Olacineæ. The first, *Ctenolophon*, is one of the few genera of the order with opposite leaves. The second, *Pteleocarpa*, includes two species from Malacca and Borneo.—Prof. Thaiselton Dyer on the Assam tea-plant. The Chinese tea-plant is not known in the wild state. The Assam tea-plant may be its indigenous form, but presents well-marked differences.—Dr. Braithwaite on *Zoopsis*, Hook. and Tayl., a genus of Hepaticæ.

Chemical Society, April 18.—The president, Dr. Frankland, F.R.S., in the chair.—The secretary read two papers by Mr. E. A. Letts, "On benzyl isocyanate and cyanurate," and "On a compound of sodium and glycerine."—Prof. Hunly, of Kiel, who spoke in German, gave an account of a new method of determining the carbonic acid in sea-water, and of an apparatus for collecting the water at great depths, which could be immersed to the required distance below the surface, and then closed by means of stop-cocks. These are turned by powerful springs released at the proper moment by an electro-magnet.—Dr. E. T. Thorpe followed with notes on the action of phosphorus pentasulphide on tetrachloride of carbon, and on the degree of solubility of silver chloride in strong nitric acid.—Dr. Hofmann, F.R.S., then gave a brief account of the new phosphorus bases, which he had recently obtained by the action of alcoholic iodides on iodide of phosphonium on the presence of zinc oxide, and illustrated his remarks by several striking experiments.

Mathematical Society, April 11.—Prof. Cayley, F.R.S., vice-president, in the chair.—Prof. Cayley gave an account of a paper "On the Mechanical Description of certain Sextic Curves."—Mr. Roberts then exhibited an apparatus for the description of such curves as had been alluded to by Prof. Cayley; and further drew attention to an analogous manner in which certain surfaces of the fourth degree may be generated.—A discussion followed upon some questions proposed in which the chairman, Prof. Crofton, Messrs. Cotterill, Merrifield, Sprague, and others took part.

Photographic Society, April 9.—James Glaisher, F.R.S., in the chair. A paper on Merget's Mercury-Printing Process was read, and some photographs produced by its means were shown. The photographic image is produced by the reduction of silver, or other precious metal, salts, by mercuric vapour, which has been in the first place collected upon a cliché obtained in the camera. The process is not yet sufficiently elaborated to be of much practical value.—A paper "On the Photographic Image upon a Bichromate Film" was read by Mr. H. Baden Pritchard, who demonstrated by a few examples the rapidity with which the image, once started by light upon a carbon tissue, continues to acquire vigour after the latter has been withdrawn from the action of the solar rays.

Victoria Institute, April 15.—The Rev. J. G. Wood "On the Rationality of the Lower Animals." He gave various instances of the instinct and rationality of different animals inhabiting various portions of the globe, and dwelt principally on the latter, which he considered many animals to possess, though in a very limited sense. An interesting discussion followed, in which Captain Petrie pointed out that had the animal creation no rationality, or rather intelligence, it would be without an attribute, which helped to make it more subservient to man's wants. The Rev. C. A. Roe pointed out that the reasoning powers of man were different from the reason possessed by animals, which was exceedingly limited, and of a peculiar nature.

MANCHESTER

Literary and Philosophical Society, March 5.—E. W. Binney, F.R.S., president, in the chair. "On Changes in the Distribution of Barometric Pressure, Temperature, and Rainfall under different Winds during a Solar Spot Period," by Joseph Baxendell, F.R.A.S.—"Further Experiments on the Rupture of Iron Wire," by Mr. John Hopkinson.

Physical and Mathematical Section, November 7, 1871.—Alfred Brothers, F.R.A.S., vice-president, in the chair. "On Changes in the Distribution of Barometric Pressure, Temperature, and Rainfall, under different winds, during a Solar Spot Period," by Joseph Baxendell, F.R.A.S.

December 5, 1871.—Mr. Thomas Carrick in the chair. "On the Distribution of Rainfall under different Winds, at St. Petersburg, during a Solar Spot Period," by Joseph Baxendell, F.R.A.S.

February 27.—E. W. Binney, F.R.S., vice-president of the section, in the chair. "Results of Observations, registered at

Eccles, on the Direction and Range of the Wind for 1869, as made by an Automatic Anemometer for Pressure and Direction," by Thomas Mackereth, F.R.A.S.—"On Black Bulb Solar Radiation Thermometers exposed in various Media," by G. V. Vernon, F.R.A.S.—Note "On the Relative Velocities of different Winds, at Southport, and Eccles, near Manchester," by Joseph Baxendell, F.R.A.S.

CAMBRIDGE

Philosophical Society, March 11.—Mr. E. H. Morgan, of Jesus College, and Mr. J. W. Cartmell, of Christ's College, were elected fellows. The following communications were read:—(1) By Mr. Hiern, "A monograph of the *Ebenacea*." This elaborate paper will shortly appear in the Society's Transactions. (2) By Dr. Bacon, "The influence of human generations on the production of insanity." The author brought forward statistics to prove that insanity was proportionate to poverty—the greatest number of insane persons being found in the poorest districts. Hence he considered that ameliorating the condition of the people was of the first importance in the attack on this disease. (3) By Mr. J. W. L. Glaisher, "Supplement to a table of Bernoulli's numbers."

EDINBURGH

Royal Society, March 18.—Sir Robert Christison, Bart., president, in the chair.—"On the Extraction of a Square Root of a Matrix of the Third Order," by Prof. Cayley.—"Second Note on the Strain-Function," by Prof. Tait.—"Note on the Rate of Cooling at High Temperatures," by Prof. Tait.—"Notice of a Whinstone Boulder with Artificial Markings and Grooves on it," by Mr. D. Milne Home, LL.D.—"Notice of the Fruiting of the Ipecacuan Plant in the Edinburgh Royal Botanic Garden," by Prof. Balfour.

Royal Physical Society, March 27.—Mr. C. W. Peach, president, in the chair. Note on the occurrence of the Hoopoe (*Upupa Epops*) at Freugh, Stoneykirk, Wigtownshire, by Rev. George Wilson. The specimen, a male in perfect plumage, was shot by Mr. Cunningham on March 16.—Notice of a species of Mason Ant on the Isle of May, by James M'Bain, M.D. Dr. M'Bain visited the Isle of May on Feb. 16, and obtained specimens of the ants, with eggs, larvæ, and attendant aphides. The ants since then had been kept in glass vessels, and one of the artificial Formicariæ was exhibited to the Royal Physical Society. There appeared to be two species of ants in the colonies, one of which corresponded with the specific characters of the yellow ant, *Formica flava*, and, being in doubt as to the specific name of the brown ant, specimens of each were sent to the British Museum. Mr. F. Smith, a distinguished authority on the *Hymenoptera*, stated that "there are two species and two genera in the quill—one is *Formica flava*, the other is *Myrmica ruginodes*. The *Formica* is at once known by its single lamina, node (or scale) between thorax and abdomen; the *Myrmica* has two nodes, and also a sting. These ants commonly occupy opposite sides of the same hillock."—"On the Vegetable and Animal Life found in Natural Waters," by Dr. Stevenson Macadam.—Notes of a Tour in Auvergne, with an exposition of some of the most illustrative minerals of Central France; and remarks on the nomenclature of some species of the family *Mytilidæ*, by Mr. D. Grieve.—Analysis of "The Albert Limestone," Balmoral, by Mr. J. Falconer King.—Prof. Walley exhibited a curious example of malformation in a newly-born calf. The upper part of the skull was undeveloped, it had no apparent forelegs, only rudimentary and imperfect hindlegs, a rudimentary tail, and was otherwise imperfectly developed.

GLASGOW

Geological Society, March 21.—Mr. James Thomson, vice-president, in the chair.—"Some Recently-exposed Sections in the Paisley Clay-beds, and their Relation to the Glacial Period," by the Rev. William Fraser, of Paisley. These clays presented the following general order:—(1) Underlying all was the old boulder clay or till, the conditions of which were altogether unfavourable to life. It represented a cold, bleak, and in part tumultuary period. (2.) Immediately above this was a laminated clay, whose texture was in every way distinct from the preceding. It was generally shell-less and stoneless and beautifully laminated, the structure being at times so regular as to resemble the edge of a closed book, and specimens kept for a year or two have shown a texture and taken a polish like jasper. (3.)

Above the laminated clay, which was useful in brickmaking, there occurs a thick bed in which shells of arctic and boreal types are found—*Tellina proxima*, *Panopæa norvegica*, *Pecten islandicus*, *Cyprina islandica*, and others too numerous to specify. Geologists loved the layer for its shells, which the brick-field proprietors regarded with an intense dislike. (4.) Next in order is the clay chiefly used in brickmaking. In it the glacial shells are not to be found; the last which disappears is the *Cyprina islandica*. But in these clays, indeed in all above the laminated clay, small and large stones, up to boulders of several tons in weight, are abundant. In some instances they bear longitudinal scratches, but they are deposited so irregularly that their lines lie in every direction; showing that while the origin of the lines or striæ was to be ascribed to the period and the processes of the boulder clay, the transport and distribution of the materials was connected with subsequent movements and the melting of floating masses of ice. At the close of the formation of this clay, and on its surface, appeared patches of a well-known shell, *Mytilus edulis*, the common mussel. (5.) Closing the series is a covering of varying thickness, and composed of various materials. There sometimes appeared near the surface a coarsely laminated clay, which had occasionally been mistaken by observers for the more finely laminated clay to be found at the commencement of the series. A long period, however, must have intervened between the two, and he suggested a careful scrutiny as to the facts connected with these two distinct clays.

DUBLIN

Royal Geological Society of Ireland, February 14.—Francis M. Jennings, F.C.S., in the chair. The honorary secretary, Dr. Alexander Macalister, read the annual report of the council. The following officers for the ensuing year were then elected by ballot:—President—Dr. Alex. Macalister. Vice-presidents—Earl of Enniskillen, Colonel Meadows Taylor, J. Emerson Reynolds, Rev. H. Lloyd, F.R.S., and Sir Richard Griffith, Bart. Treasurers—William Andrews and Dr. Samuel Downing. Secretaries—Rev. S. Haughton, F.R.S., and Edward Hull, F.R.S. Council—Sir Robert Kane, F.R.S., Alphonse Gages, B. B. Stoney, W. Frazer, Dr. Alex. Carte, W. H. S. Westropp, C. R. C. Tichborne, F.C.S., Rev. Maxwell Close, Francis M. Jennings, F.C.S., Dr. Ramsay H. Traquair, Dr. J. Barker, J. Ball Greene, W. H. Baily, F.G.S., W. Ogilby, F.G.S., and R. A. Gray.—Prof. Hull, Director of the Geological Survey of Ireland, read a paper on a remarkable fault in the New Red sandstone of Whiston, Cheshire. The position of this fault is marked on the geological survey maps of Lancashire (one inch map 80 N.W.) as forming the boundary between the little isolated tract of coal measures, one mile west of Rainhill Station and the New Red sandstone. The fault ranges in a nearly meridional direction, and on the west the upper coal measures, with spirorbis limestone (first discovered by Mr. Binney, F.R.S.), are brought to the surface, and on the east the upper mottled sandstone of the Bunter division of the Trias. The Corporation of St. Helen's, in order to increase the water supply of the borough, commenced sinking a well, on Mr. Hull's recommendation, at a distance of 200 yards from the fault in the New Red sandstone close to Cumber Lane Bridge.* This well was carried down 75 yards, and from the bottom a bore hole, 18in. diameter, was driven 35 yards farther; but at 104 yards from the surface it passed through the fault, and entered hard micaceous sandstone of a purple colour belonging to the upper coal-measures. As the horizontal distance from the outcrop of the fault where it crosses the railway is 200 yards, and the depth 104 yards, it appears that the slope of the fault is about two horizontal to one vertical, or 28° from the horizontal. The usual slope of the faults in South Lancashire being two vertical to one horizontal, such a result was unexpected, and as the thickness of New Red sandstone was thus reduced below the calculated amount the quantity of water obtained (about 400,000 gallons per day) was consequently much less than that required and anticipated.

February 22.—A paper was read from Mr. G. H. Kinahan "On the Formation of Valleys and Lake-basins, with special reference to Lochlomond." The author dissented from the views which had been put forth by several eminent geologists as to sub-aerial denudation; and held that the principal valleys both in Scotland and Ireland lay along lines of faults or fissures

* This site was selected, not as being the best for water supply, but the best available.

in the subjacent rocks. In the highlands of Scotland, so far as he had observed, there was not a valley, ravine, or lake-basin unconnected with a break or fault in the strata; and instanced particularly the Caledonian Canal, Loch Awe, Glencoe, Loch Fyne, and Lochlomond. He considered the deep parts of the latter lake were due to the meeting or crossing of two or more breaks, where consequently the rocks were fractured to a greater extent. Some of the dislocations, he was inclined to think, had been post-glacial.

PARIS

Academy of Sciences, April 15.—M. de Saint-Venant read a memoir on the intensity of the forces capable of deforming ductile cylindrical blocks placed under various conditions.—M. J. Boussinesq read a memoir on the influence of the centrifugal forces upon the varied permanent flow of water in prismatic channels of great width.—M. de Saint-Venant presented a note by M. E. Combesure on a process of integration by successive approximations of the equation

$$4 \left(\frac{d^2 \psi}{dx dx} \right)^2 + \left(\frac{d^2 \psi}{dx^2} - \frac{d^2 \psi}{dz^2} \right)^2 = 4K^2$$

in plastic dynamics.—MM. P. A. Favre and C. A. Valsou presented a continuation of their researches upon crystalline dissociation. This paper contains the first part of their investigations on the alums.—A note by M. Lecoq de Boisbaudran on the spectrum of the vapour of water. The spectrum was obtained by passing an induction current through a tube filled with rarefied aqueous vapour; the spectrum consists of white stratifications, the light of which is resolved into four principal lines.—Several papers relating to auroras were read, including a note by M. Chapelas on polar lights observed in Paris on the evening of April 10; one by M. Tarry, communicated by M. Le Verrier, on the prevision of magnetic auroras by means of terrestrial currents, as applied to the aurora of April 10 by M. Sureau; a general investigation of auroras by M. Heis, including a long list of parallel occurrences of such phenomena in the northern and southern hemispheres during the years 1870 and 1871; and a note by M. Linder on the theory of auroras, in which the author concludes that they are electro-magnetic phenomena which have their seat chiefly in the upper regions of the atmosphere.—M. Loewy presented a note on the discovery of two new planets, 119 and 120, one observed in Paris on April 9 by M. Paul Henry, the other at Marseilles on April 10 by M. Borelly. The positions of these planets on April 11-13 are given.—M. Berthelot read a note on the heat of formation of the oxygenated compounds of nitrogen.—M. A. Gillot presented a claim of priority with respect to a paper read by M. Gruner on January 22 on the action of oxide of carbon on iron and its oxides.—M. Cahours presented a note by MM. L. Dusart and C. Bardy on the phenoles.—M. Bous-singault presented a note by M. A. Muntz on the statics of the cultivation of hops, containing a statement of the elements assimilated by the hop plants grown upon thirty-eight ares, and upon one hectare of land at Wörth.—A note by M. C. van Bambeke on the first effects of fecundation upon the ova of fishes and on the origin and interpretation of the mucous or glandular lamella in the osseous fishes was presented by M. de Quartrefages. The author stated, as the result of his researches, that under the influence of fecundation the germinal disc of the egg in osseous fishes divides into two layers, of which the upper one becomes segmented, whilst the lower one forms an intermediate layer between the segmented blastoderm and the vitelline sphere, and accompanies the former in its development around the latter. He regards the thin central portion of this intermediate layer as the homologue of the mucous lamella.—M. A. Gaudry read a paper on the fossil animals of the Léberon in Vaucluse. These fossils are chiefly mammalian, and present a remarkable analogy to those of the Miocene deposits of Pikermi in Attica, investigated some years since by the author.—M. A. Brongniart presented a note by M. de Saporta "On the more precise determination of certain Jurassic Coniferous Genera by Observation of their Fruits." The genera here referred to are *Brachyphyllum*, *Pachyphyllum*, *Echinostrobus*, *Cunninghamia*, *Widdringtonia*, *Palaeocypris* (a new genus proposed for some species described as belonging to *Thuyites*), and *Phyllostrobus* (a new genus allied to *Thuya*).—M. de Quartrefages communicated a note by MM. E. Massenat, P. Lalande, and Cartailhac "On the Discovery of a Human Skeleton of the Reindeer period at Laugerie-Basse in the Dordogne."—M. A. Milne-Edwards read some researches upon fossil birds, containing a sort of summary of the results of

his long-continued investigation.—M. L. V. Turquan submitted to the judgment of the Academy the description of an apparatus for indicating the presence of fire-damp in mines.

BOOKS RECEIVED

FOREIGN.—(Through Williams and Norgate.)—Anatomische-systematische Beschreibung der Alcyonarien, 1^{te} Abtheilung, die Pennatuliden: A. Kölliker.—Morphologie u. Entwicklungsgeschichte des Pennatulidenstammes, nebst allgemeinen Betrachtungen zur Descendenzlehre: A. Kölliker.—Beiträge zur Anatomie der Plattwürmer: Sommer u. Landois.—Index der Petrographie u. Stratigraphie der Schweiz u. ihrer Umgebungen: B. Studer.—Geschichte der Himmelskunde nach ihrem gesammten Umfange, Parts 1-3: J. H. v. Mädler.—Hydra, eine anatomische entwickelungs-geschichtliche Untersuchung: Dr. N. Kleinenberg.

DIARY

THURSDAY, APRIL 25.

ROYAL SOCIETY, at 8.30.—On a Supposed Periodicity in the Elements of Terrestrial Magnetism, with a Period of 26½ Days: The President.—Contributions to Formal Logic: A. J. Ellis, F.R.S.
LONDON INSTITUTION, at 7.30.—On the Effects of Certain Faults of Vision on Painting, with especial reference to the Works of Turner and Mulready: Dr. Liebreich.
ROYAL INSTITUTION, at 3.—On Heat and Light: Prof. Tyndall, F.R.S.

FRIDAY, APRIL 26.

ROYAL INSTITUTION, at 9.—On the Genius and Character of the Modern Greek Language: Prof. Blackie, F.R.S.E.
QUEKETT MICROSCOPICAL CLUB, at 8.

SATURDAY, APRIL 27.

ROYAL INSTITUTION, at 3.—The Star-Depths: R. A. Proctor.
GOVERNMENT SCHOOL OF MINES, at 8.—On Geology: Dr. Cobbold.

SUNDAY, APRIL 28.

SUNDAY LECTURE SOCIETY, at 4.—On Geographical Influences on History: Prof. John Young, M.D.

MONDAY, APRIL 29.

ZOOLOGICAL SOCIETY, at 1.—Anniversary Meeting.
LONDON INSTITUTION, at 4.—Elementary Botany, with special reference to the Classification of Plants: Prof. Bentley, F.L.S.

TUESDAY, APRIL 30.

ROYAL INSTITUTION, at 3.—On the Development of Belief and Custom amongst the Lower Races of Mankind: E. B. Tylor, F.R.S.

WEDNESDAY, MAY 1.

ROYAL INSTITUTION, at 2.—Annual Meeting.
SOCIETY OF ARTS, at 8.—On Telegraphy without Insulation, the means of cheapening Internal Communication: H. Highton.
MICROSCOPICAL SOCIETY, at 8.

THURSDAY, MAY 2.

ROYAL SOCIETY, at 8.30.
SOCIETY OF ANTIQUARIES, at 8.30.
LINNEAN SOCIETY, at 8.—On *Alibertia edulis*: Señor Correa de Mello.
CHEMICAL SOCIETY, at 8.
ROYAL INSTITUTION, at 3.—On Heat and Light: Prof. Tyndall, F.R.S.

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ERRATUM.—Mr. J. J. Hall requests us to correct an error in the "Contents" of our last number, whereby he is described as "F.R.S." instead of "F.M.S."