have less rain, and less contrasts also. On the north-east of the peninsula of Celebes the rains are comparatively light, and there is a well-marked dry season. In Java, the rainfall is lightest in the east, and the dry season is longer and more sharply defined, so that vegetation has a time of arrest corresponding to our winter.—Psychrometer studies, by Prof. H. A. Hazen. This is a continuation of a discussion between Prof. Hazen and Dr. Ekholm, of Stockholm, on the behaviour of the psychrometer with respect to water vapour and ice vapour.

Bulletin of the American Mathematical Society, vol. ii. No. 5, February.—"Remarks on the progress of celestial mechanics since the middle of the century" is the presidential address delivered before the Society on December 27, 1895, by Dr. G. W. Hill. The address opens with the statement that a thoroughly satisfactory history of the subject has yet to be written, and then the author rapidly analyses some of the books that touch upon it, as Gautier's "Essai historique sur le problème du trois corps" (1817), Laplace's historical chapters in the last volume of the "Mécanique Céleste," Todhunter's "History of the Theories of Attraction and the Figure of the Earth," and Tisserand's "Traité de Mécanique Céleste." The scarcity of memoirs and books on the same subject accessible to American students, unless they work abroad, is dwelt upon, and then Dr. Hill opens with a consideration of Delaunay's method (*cf.* his "Théorie du Mouvement de la Lune"). Pointing out that Delaunay's method has not yet received all the developments and applications it is susceptible of, he next merely mentions Hansen's treatise on the perturbations of the small planets, and then confines his attention to a careful examination of the labours of Prof. Gyldén and M. Poincaré. He here enters into considerable detail, and closes with the remark that we owe much to M. Poincaré for his attack, "but the mist is not altogether dispelled; there is room for further investigation." This last remark is made with reference to the Lindstedt series, which "if convergent, would establish the non-existence of asymptotic solutions" (*cf.* a paper by the same author in the January number of the *Bulletin*, noticed in NATURE, No. 1373, p. 382).—A short note follows on Kronecker's linear relation among minors of a symmetric determinant, by Prof. H. S. White.—Dr. G. A. Miller's note on the lists of all the substitution groups that can be formed with a given number of elements, is a valuable historical *résumé* of recent and past work in this subject.—On Cauchy's theorem concerning complex integrals, by Prof. M. Bôcher, closes the mathematical papers.—From the Notes we learn that Prof. White's paper was read before the Society.

In the December number of the *Botanical Gazette* (vol. xx.), Mr. Frederick V. Coville, the Botanist of the U.S. Department of Agriculture, contributes a very interesting account of the botanical explorations of Dr. Thomas Coulter in Mexico and California, between the years 1824 and 1834. Among the chief botanical explorers in North America during the first half of the present century was Coulter. His collections were the basis of important contributions to the descriptive botany of Mexico and California. Born near Dundalk, Ireland, in 1793, he graduated in the Dublin University in 1817, studied under De Candolle at Geneva, and published his monograph of Dipsaceæ in 1824. He was Keeper of the Herbarium of Trinity College, Dublin, from 1834 to 1843. This account is accompanied by a copy of the principal part of the map published with Coulter's "Notes on Upper California," and Mr. Coville adds that he hopes in the near future to publish the letters of Coulter to A. Pyramus and Alphonse De Candolle, of which, through the courtesy of Dr. Casimir De Candolle, he has had copies. He further earnestly begs for any additional facts relating to Coulter, which should be sent to him to the Agricultural Department, Washington, U.S.

L'Anthropologie, Tome vi. No. 6.—Researches on the weight of the brain among the lunatics at St. John's Hospital, Copenhagen, by F. Meyer and P. Heiberg. In these investigations, which have extended over more than ten years, the authors have excluded brains that have suffered great loss of substance, those that have been the subjects of considerable cerebral hæmorrhage, and those that presented large tumours; on the other hand, brains suffering from œdema, anæmia, hyperæmia, atrophy, or periencephalitis have been included. The mean weight of 398 brains of men was found to be 1320 grammes; the greatest weight was 1866 grammes, and the least 995 grammes. 292 brains of women were examined; the mean weight was 1177 grammes, the heaviest weighed 1509 grammes, and the lightest 780 grammes. It appears that the brain gradually diminishes in weight after about fifty years of age.—On marriage amongst the Polynesians of the Marquesas Islands, by Dr. Tautain. Some of the marriage ceremonies described by the author clearly point to a time, not very remote, when all the women were common property, and marriage was unknown. A man on his marriage acquires the right of a husband over all his wife's sisters, and at the same time his brothers are entitled to exercise similar privileges with respect to the newly-made bride. In the author's opinion the Marquesans are a degraded people, and do not deserve the least sympathy.—Prehistoric stations in the neighbourhood of Marseilles, by E. Fournier. In this paper are recorded the results of digging operations at 110 stations, 45 of which have yielded evidence of the fauna and of prehistoric industry. They may be arranged in four groups: (1) The Magdalenian, (2) those belonging to the transition period, (3) the Lower Neolithic, (4) the Upper Neolithic.—Sculpture in Europe before Græco-Roman influence, by Salomon Reinach. The author enters upon the last part of his inquiry, viz. the representation of animals in primitive art, and the association of the human form with the forms of animals.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, March 5.—"On the Diurnal Periodicity of Earthquakes." By Charles Davison, M.A.

Reference is made to the previous work of De Montessus and Omori, the former endeavouring to show that the diurnal periodicity of earthquakes is apparent rather than real, and the latter pointing out that a marked diurnal periodicity characterises the after-shocks of great earthquakes in Japan.

The results of twenty-six registers obtained by means of continuously recording instruments in Japan, the Philippine Islands, and Italy are subjected to harmonic analysis with the following conclusions:—

(1) The reality of the diurnal variation of earthquake-frequency seems to be proved by the approximate agreement in epoch (mean local time) of the first four components (24, 12, 8, and 6 hours) for the whole year at Tōkiō and Manila, and for the winter and summer halves of the year at Tōkiō.

(2) In ordinary earthquakes, there is in nearly every case a marked diurnal period, the maximum generally occurring between 10 a.m. and noon. The semi-diurnal period, though less prominent, is also clearly marked, the maximum occurring as a rule between 9 a.m. and noon and between 9 p.m. and midnight. Other minor harmonic components are also occasionally important, the first maximum of the eight-hour component probably occurring about 6.30 a.m., and that of the six-hour component about 3 or 4 a.m.; but for these two epochs the results are not always concordant.

(3) Though the materials are insufficient for any general conclusion, the weaker shocks seem to be subject to a more marked diurnal periodicity.

(4) In the case of after-shocks of great earthquakes, the diurnal periodicity is as a rule strongly pronounced. The maximum of the diurnal period occurs within a few hours after midnight, but the epochs of the other components are subject to wide variation, possibly on account of the short intervals over which the records extend. A special feature of after-shocks is the prominence of the eight-hour and four-hour components.

The epochs of the first four components representing the diurnal variation of seismic frequency are compared in several cases with those for barometric pressure and wind velocity. While the variation of the former cannot be attributed exclusively to either of the latter phenomena, it seems not improbable that the diurnal periodicity of ordinary earthquakes may be due chiefly to that of wind velocity, and the diurnal periodicity of after-shocks chiefly to that of barometric pressure.

Geological Society, February 26.—Dr. Henry Hicks, F.R.S., President, in the chair.—On the structure of the Plesiosaurian skull, by Charles W. Andrews. Owing to the imperfection of the specimens described, various previous accounts of the Plesiosaurian skull were incomplete, and differed from one another in important particulars. There was in the National Collection a fine skull of *Plesiosaurus macrocephalus* which had lately been cleared from the matrix, with a description of which the author was mainly occupied, though other specimens, which were of assistance in clearing up some

difficulties, were also noticed. The author particularly considered the structure of the palate, and only such points in the structure of the rest of the skull as added to or were at variance with previous descriptions were considered.—On certain Granophyres, modified by the incorporation of Gabbro fragments, in Strath (Skye), by Alfred Harker. The rocks described formed a group of irregular intrusions, the largest less than a mile in length, situated in the tract of volcanic agglomerate north and west of Loch Kilchrist. They differed from the normal Granophyres, abundantly developed in the neighbourhood, in being darker, denser, and manifestly richer in the iron-bearing minerals, while in places were seen numerous small rock-fragments evidently of extraneous origin. In the discussion that followed, Sir Archibald Geikie pointed out that the paper had a double value. In the first place, it was important in regard to the local geology of the Western Isles, for it demonstrated by new evidence the posteriority of the Granophyres to the Gabbros; and in the second place, it had a suggestive bearing upon questions of theoretical interest regarding the possible modification of eruptive rocks by the incorporation of foreign material into their substance.—Observations on the geology of the Nile Valley, and on the evidence of the greater volume of that river at a former period, by Prof. E. Hull, F.R.S. The author drew attention to the two great periods of erosion of the Nile Valley, the first during the Miocene period, after the elevation of the Libyan region at the close of Eocene times, and the second during a "pluvial" period extending from late Pliocene times into and including the Pleistocene. In the second part of the paper the terraces of the Nile Valley were described, and full details given of the characters of a second terrace, at a height varying from 50 to 100 feet above the lower one, which is flooded at the present day. This second terrace was traceable at intervals for a distance of between 600 and 700 miles above Cairo. Two old river channels were also described, one at Koru Ombo, and the other at Assuan itself. The author discussed the mode of origin of the second terrace and the old river valleys, and believed them to be due to the former greater volume of the river, and not to subsequent erosion of the valley. He gave further evidence of the existence of meteorological conditions sufficient to give rise to a "pluvial" period, and pointed out that other authors had also considered that the volume of the Nile was greater in former times.—The fauna of the Keisley limestone, part i., by F. R. Cowper Reed. The author had examined a very full series of fossils from the Keisley limestone of Westmoreland, and proposed to describe the fauna of the limestone. In this (first) part of the paper a description of the Trilobites was given.

Zoological Society, March 3.—Sir W. H. Flower, K.C.B., F.R.S., President, in the chair.—Mr. G. E. H. Barrett-Hamilton exhibited two skeletons and other bones of the Norway lemming (*Myodes lemmus*), obtained by Dr. H. Gadow from caves in South Portugal. This discovery had increased our knowledge of the distribution of the Norway lemming in past times. In present times the Norway lemming was, roughly speaking, only to be found in Norway and Lapland, its southern range extending to about 58½° N. lat.; but its remains had been met with in England, and in Quedlinburg in Saxony. Dr. H. Gadow, F.R.S., gave an account of the caves in Southern Portugal in which he had procured these lemmings' bones along with those of other animals.—Mr. Sclater opened a discussion on the rules of zoological nomenclature by reading a paper on the divergences between the rules for naming animals of the German Zoological Society and the Stricklandian code usually followed by British naturalists (see NATURE, March 5, p. 427).—A communication was read, from Graf Hans von Berlepsch and M. J. Stolzmann, on the ornithological researches of M. J. Kalinowsky in Central Peru. The collections made in the years 1890-93 had been transmitted to the Branicky Museum of Warsaw, and contained examples of 295 species and sub-species, of which an account was given in the present paper. Five species and twenty-two sub-species were described as new.—Dr. David Sharp, F.R.S., on behalf of the Committee for investigating the flora and fauna of the West India Islands, communicated a paper on West Indian terrestrial Isopod Crustaceans prepared by M. Adrien Dollfus. The paper contained an account of the Armadilloidian Isopods, of which specimens had been obtained by Mr. H. H. Smith in the islands of Grenada and St. Vincent and the adjacent islets. These were referred to thirteen species, all but one of which were described as new to science.

Entomological Society, March 4.—Mr. Walter F. H. Blandford, Vice-President, in the chair.—Mr. Percy H. Grimshaw exhibited specimens of *Cephenomyia rufibarbis*, Meigen, a new British bot-fly parasitic on the red deer. The specimens were collected in Ross-shire, in June and July 1894, and in the Cairngorm Mountains in 1895.—Mr. C. G. Barrett exhibited, for Mr. Porritt, a black variety of *Polia flavicincta*, taken at sugar in his garden at Huddersfield.—Mr. A. H. Jones exhibited specimens of the butterflies captured at Coomassie by Major Henry P. Northcott during the recent expedition.—Sir John T. D. Llewelyn, Bart., M.P., exhibited specimens of a small species of Diptera which he believed to be parasitic on *Trochilium sphegiforme*, as he had bred a number from that species. He remarked that *T. sphegiforme*, although one of the most local moths in this country, had occurred last year on the estate of Sir J. Hills-Johnes, K.C.B., in Carmarthenshire, in such numbers in the larval state as almost to destroy the whole of the alders growing there. Mr. G. H. Verrall said that the insects belong to a species of *Phora*, possibly *Phora rufipes*, which fed on almost everything.—Mr. Hampson exhibited an exotic species of Locustidæ which Lord Walsingham, F.R.S., had found in his conservatory at Merton Hall, Norfolk.—Dr. Sharp, F.R.S., exhibited specimens of the pupæ of *Micropteryx* (probably *semipurpurella*) and drawings to illustrate their structure. The pupæ were sent to him by Dr. Chapman, who had described their peculiarities in the *Transactions* of the Society in 1893. Dr. Sharp considered the pupa to be that of a Trichopterous insect; most of its structures were those of Trichoptera, and the account given by Dr. Chapman of its emergence showed that this was essentially the same as that of Trichoptera. Mr. McLachlan said that so long ago as 1865 he had suggested the close affinity of *Micropteryx* to the *Trichoptera*. Mr. Hampson, Mr. Barrett, and Mr. Blandford also took part in the discussion which ensued.—Mr. McLachlan exhibited a singular instance of monstrosity in a dragon-fly. The insect was a male of *Hetærina occisa*, Hag., from Venezuela.—Mr. E. E. Green exhibited a larva of an Homopterous insect—one of the *Cicadinæ*—from Ceylon, having what appeared to be a head at its caudal extremity.—M. Louis Péringuey contributed a paper, entitled "Descriptions of New Species of South African Coleoptera, chiefly from Zambesia."—Dr. Sharp read a paper, by Prof. Williston, entitled "On the Diptera of St. Vincent, West Indies. Part I."

Chemical Society, March 5.—Mr. A. G. Vernon Harcourt, President, in the chair.—The following papers were read:—The explosion of cyanogen, by H. B. Dixon, E. H. Strange, and E. Graham. When cyanogen, mixed with an equal volume of oxygen, is fired in a long tube, it burns directly to carbonic oxide, and by the use of a photographic method of recording the explosion wave, it is seen that the wave-front is followed by only a very short luminous tail; when a mixture of one volume of cyanogen and two of oxygen is fired, the sharply defined wave-front in which combustion to carbonic oxide occurs, is followed by a long highly luminous tail in which combustion to carbon dioxide occurs.—On the mode of formation of carbon dioxide in the burning of carbon compounds, by H. B. Dixon. The author discusses the various current views respecting the function of water vapour in making a mixture of carbonic oxide and oxygen inflammable; in connection with the dissociation theory of the action, it is shown that the Röntgen rays do not cause the dry mixture to become inflammable.—On the explosion of chlorine peroxide, by H. B. Dixon and J. A. Harker. When cyanogen, acetylene, or carbon disulphide vapour is detonated at one end of a long tube in which it is contained, the explosion wave is not propagated far along the tube; mixtures of chlorine peroxide and oxygen when similarly treated, however, decompose regularly, a true explosion wave being propagated through the gas at about 1100 metres per second.—Note on the use of certain phosphorescent substances in making X-rays visible, by H. Jackson. The most suitable form of vacuum tube for examining the Röntgen rays is one containing a concave aluminium kathode and an inclined platinum anode; the latter spreads the rays from the kathode in all directions, apparently by scattered reflection. A high vacuum is necessary for good results. The most brilliantly phosphorescent substance out of three hundred examined by the author is potassium platinicyanide; it crystallises with $3H_2O$, and since it is most active in its fully hydrated state, should be painted on to black cardboard or vulcanite for use as a screen, in such a way that it can be kept moist. The other

platinicyanides and the platosamine salts are less fluorescent. A study of the discharge phenomena observed during the exhaustion of the tube shows that the rays proceeding from the concave kathode meet at the centre of curvature of the latter, and then diverge in a solid cone; as the vacuum becomes higher, this cone gradually narrows until it becomes at length a straight line. It is interesting to note that this latter would be the behaviour of non-elastic particles emanating normally from the concave kathode.—The union of carbon and hydrogen, by W. A. Bone and D. S. Jordan. On heating carefully purified sugar charcoal to a white heat in hydrogen, 1 to 2 per cent. of the latter is converted into methane. During the burning of an electric arc lamp in hydrogen, acetylene and another hydrocarbon, probably methane, are produced.—Note on the $\alpha\alpha_1$-dimethylglutaric acids, by W. A. Bone and W. H. Perkin, jun.—The symmetrical dimethylsuccinic acids, by W. A. Bone and W. H. Perkin, jun.—The cis- and trans-methylisopropylsuccinic acids, by W. H. Bentley, W. H. Perkin, jun., and J. F. Thorpe. In these three papers the preparation and properties of the acids named are described.

Linnean Society, March 5.—Mr. W. Percy Sladen, Vice-President, in the chair.—On behalf of Capt J. Marriott, Mr. Harting exhibited an antler of the Burmese deer (*Cervus Eldi*), and described a singular condition in another example which for eight years had continued to exude a blood-coloured liquid from a puncture on the under surface of the brow-tine. Prof. Stewart, to whom some of the substance had been submitted for examination, had found no blood-corpuscles therein, and considered it to be grease in a semi-fluid condition, the nature of the colouring matter being as yet undetermined. Mr. Druce thought the substance exuded might be the excretion of the larvæ of some insect feeding upon the internal surface of the horn, and suggested the examination of a section, if possible.—Mr. Harting exhibited a drawing from life of a Klipspringer antelope (*Oreotragus saltator*), lately received (for the first time in this country) at the Zoological Society's Gardens.—Mr. Thomas Christy exhibited several cases of butterfles collected by Mr. Horace Billington in Old Calabar, on which remarks were made by Messrs. W. F. Kirby and H. Druce.—Mr. B. D. Jackson, in directing attention to an English translation by Mr. J. Lucas of that portion of Pehr Kalm's "Travels" which relates to England, remarked that few persons were aware that Kalm, a pupil of Linnæus, had in 1748 spent six months in this country and had diligently noted the plants which he met with. Thus he had recorded no less than sixty plants for Hertfordshire alone, deriving some of his information from an examination of the contents of two haystacks in that county—in this way anticipating by more than a century one of the methods employed by Sir John Lawes and Sir J. H. Gilbert, and by Prof. Fream.—On behalf of Prof. Gustav Gilson, of Louvain, two papers, entitled "Studies in insect morphology," were communicated by Prof. Howes. In the first of these, on segmentally disposed thoracic glands in the larvæ of *Trichoptera*, the author found that in *Limnophilus flavicornis* the prothoracic prominence gives exit to an underlying tubular gland. In *Phryganea grandis* each thoracic sternum gives exit to a glandular apparatus of the same category, the prothorax alone developing a prominence.—In the second paper by Prof. Gilson and M. J. Sadones, on the larval gills of *Odonata*, the authors described in each branchial lamella of *Libellula depressa* three conical processes which are functional in preventing adherence of the lamella to its fellows, and in maintaining full exposure to the surrounding medium.

Mathematical Society, March 12.—Major MacMahon, R.A., F.R.S., President, in the chair.—The President read the following abstract of a paper by Prof. Lloyd Tanner, on the enumeration of groups of totitives. The paper explains a method of determining how many groups of given order can be formed with the totitives of any integer, n. In the investigation use is made of a function formed from a binomial coefficient by replacing each factor, sày r, of the numerator or denominator by $p^r - 1$, so that the binomial coefficient is in fact the limiting value of the function as p approaches 1. There are indications of the existence of a reciprocity theorem (viz. that the number of groups of order ν is equal to the number of groups of order $\tau(n)/\nu$), but this theorem is not proved. The attempt to establish the theorem has led to the discovery of some notable properties of the functions—a Van der Monde-theorem, for instance. The functions in question are well known. They were used by Euler as generating functions for the number of partitions, and by Cayley ("Researches on the Partition of Numbers," *Phil. Trans.*, cxlv.). Jacobi in a memoir (*Crelle*, xxxii., 1846), starting with a more general function, obtained a number of formulæ which appear to be different from those used in this paper. Gauss, in the *Summatio serierum quarundam singularium*, used these functions, the base being a complex number of modulus 1. They have been used too (in Schellbach's treatise) as a means of forming the theta-functions. The present application is of a different kind. As in Euler's theory, they are used for enumeration; but the number sought is given by the actual value of the function when the base p is a prime factor of τn.—Prof. Greenhill, F.R.S., next read a paper on the associated dynamics of a Top, and of a Body under no Forces. Jacobi's theorems (*Werke*, ii. p. 480) flow naturally from Darboux's representation by means of the deformable hyperboloid (Despeyrous, *Mécanique*, ii. Note xx.). The hyperboloid is constructed, in Henrici's manner, flattened in the plane of the focal ellipse, by placing the generating lines tangential to the focal ellipse, and knotting together at the points of crossing the generators of opposite systems. Planes are drawn through any point H perpendicular to the generators HP_1, HP_2, through H (the tangents to the focal ellipse through H), the perpendiculars OG, OC are drawn from the centre O upon these planes, and the perpendiculars OY_1, OY_2 on the generators HP_1, HP_2. Then, during the deformation of the hyperboloid, the lengths OG, OC, or HY_1, HY_2 remain constant, and the points V, T, P in which a generator meets the principal planes are fixed points on the generators; so that the planes through H perpendicular to the generators are tangent planes at H to two fixed coaxial quadrics, the squares of whose semi-axes are numerically equal to the rectangles HY.HV, HY.HT, HY.HP, the sign being taken positive or negative according as Y and V, or T, or P are on the same or opposite sides of H. These quadrics are the momental quadrics of Jacobi's two associated bodies moving under no forces; but as the quadrics are unrestricted in shape, the bodies must be composed of matter which is capable of having a negative density, as is the two-fluid theory of electricity. The curve described by H is a polhode curve common to the two momental quadrics; it is also a line of curvature formed by the intersection of a confocal ellipsoid and a hyperboloid of two sheets; thus any such line of curvature may be taken as a polhode on either of two momental quadrics, the generating lines of the confocal hyperboloid of one sheet through any point being the normals of the quadrics. If OG is held in a vertical position, OC will imitate the associated motion of the axis of a top, if H is moved always in a direction perpendicular to the plane OGC, and OH will represent the resultant angular momentum. If the momental spheroid of the top at the fixed point O is a sphere, then OH will also represent the resultant angular velocity; but in the general case the resultant angular velocity is represented by the vector OI to a point I fixed in the generator HP_2. In constructing *pseudo-elliptic* cases of motion, the ratio of the axes of the focal ellipse is taken as the modulus of the elliptic functions, and the position of P corresponding to a parameter one-nth part of a period will be determined geometrically by means of the poristic relation of a polygon of n or $2n$ sides, circumscribed to the focal ellipse and inscribed in a confocal. The secular term, associated in general with the azimuth, can be cancelled by placing H in the tangent at P_1 in a position given by a simple relation; and now the cone described by OC is algebraical, as also the herpolhode described by H in the plane perpendicular to OG. Thus for Halphen's algebraical herpolhode, P_1 is at Fagnano's point, and H is the mid-point of P_1Y_1. If P_2 is at the end of the minor axis of the focal ellipse, the axis OC of the top describes cusps. If H is placed at Y_2, then OC represents the motion of the thread of a spherical pendulum. After a brief discussion, in which the President and Mr. Love, F.R.S., took part, Prof. Greenhill made a communication on the Catenary on the Paraboloid and Cone. Clebsch's equations for the form of a chain wrapped on a sphere, which is revolving about a vertical axis with sufficient rapidity for the attraction of gravity to be negligible, are here shown to be immediately applicable to the case of a chain on a vertical paraboloid, when gravity is again taken into account. An elliptic integral of the third kind is required, with a pole at the vertex of the paraboloid, and this integral can be compared immediately with the standard form of the pseudo-elliptic integral, by the solution of a certain Jacobian quartic. The arc of the catenary is also directly reducible to the form employed by Abel (*Œuvres*, ii.). The motion of a little ball, rolling on the paraboloid, is re-

ducible to integrals of a similar nature; but in no case does it appear that its path, nor the catenary, can become of a purely algebraical nature. In the catenary on the vertical cone, as well as in the motion of a sphere rolling on the cone, the integrals are more directly reducible to the Jacobian form. In each case the developed catenary or trajectory is the form assumed for a constant central attraction or repulsion.—Lieut.-Colonel Allan Cunningham, R.E., gave a proof that $\frac{1}{4}(5^{11}-1) = 12,207,031$, and $\frac{1}{8}\cdot\frac{1}{23}(7^{11}+1) = 10,746,341$, are both prime numbers.

Royal Meteorological Society, March 18.—Mr. E. Mawley, President, in the chair.—Mr. Frederic Gaster, of the Meteorological Office, delivered a lecture on weather forecasts and storm warnings, how they are prepared and made known, which he illustrated by numerous instruments, diagrams, and lantern slides. Mr. Gaster said that in the preparation of forecasts the position held by the barometer was so much more important than that of any other instrument, that its action must be fully comprehended if the rest of the work was to be at all clearly understood. The lecturer having fully explained this, referred to the use of a single isolated instrument, and showed how new light was thrown on the observer who could have telegraphed to him simultaneous observations from a large number of places scattered over a considerable area of the earth's surface. The kind of variation in the distribution was dealt with, isobars were drawn, and the phenomena which they exhibit in the way of high and low pressure areas described. An explanation was given of the terms "cyclonic" and "anticylonic," and the generally opposite characteristics of these two systems were referred to. Mr. Gaster next drew attention to the obvious importance of the variation in the weather over a given area caused by alterations in the position of the cyclonic and anticyclonic systems, and the importance of the fact that the former tended to move round the latter from left to right. This led to some remarks on the indications observed when disturbances were advancing towards our islands from different points. Attention was drawn to secondary systems, both of high and low pressure, the forms they assume, and their effect on the weather which, but for their presence, would probably have accompanied their primaries; and the necessity for allowing for such systems in sending warnings to our coasts. The lecturer then remarked on the value of auxiliary information, such as is to be obtained from decided changes in the direction of the wind, sudden changes of temperature, the movements of clouds at different levels, observations made at high-level stations, and telegrams from the United States. Mr. Gaster next explained how the information is made known to the public. Forecasts are issued by the Meteorological Office in the *Daily Weather Report*, and also communicated to the press, &c. Hay harvest forecasts are issued to certain selected authorities, who circulate them as much as possible in their neighbourhood. Storm warnings are telegraphed to our coasts with instructions to hoist the cone-point up when the gale is probable from northerly to easterly points, and point down when from southerly to westerly points. In conclusion the lecturer drew attention to the marked improvement which had occurred in these warnings in recent years, and to some of the occurrences which from time to time caused failures.

EDINBURGH.

Royal Society, March 2.—Prof. Geikie in the chair.—A paper was read by Mr. C. A. Fawsitt, on peroxide of hydrogen in reference to its use as an antiseptic. Since its introduction into surgery by Sir Benjamin Richardson, peroxide of hydrogen had not become so popular as was expected. It possessed undeniable advantages—*e.g.* when its oxygen was given off only water remained. But it had the disadvantages of irritability and instability. The former was due to the presence of acids, usually HCl, and solid matter. This was to be avoided by exercising great care in its preparation. The instability of H_2O_2 varied with the method of preparation adopted. Mr. Fawsitt recommended that whenever it was procured, it be diluted to the strength required in practice, and kept in a dark place.—Dr. D. Fraser Harris communicated the results of experiments he had been conducting on some points in the physiological chemistry and coagulation of milk. He found that the small globules, as well as the large, contained fat in direct, and "caseinogen" in indirect proportion to their size. Milk that was heated nearly to boiling point gave the best results with artificial digestion.—Mr. R. C. Mossman read a paper on the seasonal death-rate from certain diseases in Edinburgh during the period 1878-94, with remarks on the relation between weather and mortality. He exhibited the curves of the mortality from various diseases plotted above those denoting temperature, variability of temperature, and rainfall. The most marked result was that bronchitis, pleurisy, and pneumonia, while only very slightly influenced by low temperature, were very directly associated with variability of temperature.

March 16.—Prof. Copeland in the chair.—Mr. J. Y. Buchanan read a paper on the action of water on monochloracetic acid.—Dr. David Hepburn communicated a revised description of the dorsal interosseous muscles of the human hand, with suggestions for a new momenclature of the palmar interosseous muscles, and some observations on the corresponding muscles in the anthropoid apes. The shaft of each metacarpal bone, with the exception of the first, presents two triangular areas, a larger in the dorsal aspect and a smaller in the palmar aspect, neither of which affords origin to muscular fibres. It follows, therefore, that the palmar aspect of the various metacarpal bones are more fully occupied by muscles than the dorsal aspects. The dorsal interosseous muscles, which are abductor in function, are smaller than current descriptions lead us to believe. This is quite in accordance with the comparatively feeble nature of the abductor movements. Each digit is provided with a short flexor muscle presenting radial and ulnar heads, which are capable of acting *independently*, and thereby producing a certain amount of abduction and adduction according to their position with regard to the middle line of the hand. Every muscle of the dorsal or abductor series is inserted in common with *one of the heads* of a short flexor muscle, and in consequence of their close fusion the line of separation between them is somewhat obscured and has been overlooked. The members of the palmar or true adductor stratum have all disappeared from the human hand with the exception of the adductor *Pollicis obliquus et transversus*; hence the action has been thrown upon certain heads of the short flexors, and in consequence these heads stand out more distinctly, especially as their presence is not marked by fusion with any other muscle. Whenever true adductor muscles are found, as in certain of the apes, they are inserted in conjunction with those heads of the short flexors which are capable of supplementing this action. In the case of the human pollex, which possesses the one true adductor muscle, not only is this muscle inserted in common with one head (the ulnar) of the *Flexor brevis pollicis*, but in consequence that that head is always obscured, and in many cases extinguished.—Mr. A. T. Masterman communicated a note on the structure and affinities of Phoronis. He suggested that Phoronis should take its place amongst the Hemichordata, since it showed various points of resemblance to Balanoglossus, to Cephalodiscus, and to Rhabdopleura.—Dr. W. Peddie communicated the second part of a paper on the torsional oscillations of wires. In the first part it was proved that the formula $y^n(x+a) = b$—where y represents the range of oscillation, k represents the number of oscillations which have taken place, and n, a, b are constants—expresses the law of decrease of the oscillations with great accuracy in any one experiment. The value of n is increased by increase of the initial range, and also by fatigue. A theoretical deduction of the formula was also given, it being assumed that the loss of energy per oscillation was proportional to a power of the range. When n is zero the curve changes form and becomes logarithmic. Thus the well-known law for small oscillations is accounted for. In the second part of the paper, additional proof of the great accuracy of the formula is given. The relation $nb = BK^n$ is established between the quantities n and b, B and K being absolute constants. And it is further shown that K is, in terms of the particular angular unit employed, the value of a *critical angle* for the given wire. This critical angle is such that, when the range is equal to it, the loss of energy per oscillation is totally independent of the magnitude of the initial range or of fatigue. When the range exceeds the critical angle, the loss of energy per oscillation is increased by fatigue; when the range is less, the loss of energy is decreased by fatigue. A theoretical explanation of the existence of a critical angle was given. In the particular wire employed, the critical angle corresponds to a twist of about 0·1° per centimetre of length.

CAMBRIDGE.

Philosophical Society, March 9.—Prof. J. J. Thomson, President in the chair.—Notes on the geological history of Monocotyledons, by Mr. A. C. Seward.—A description of the

skulls found at Girton in 1881, by R. Horton-Smith.—On some scratched stones from the Permo-Carboniferious rocks of South-east Australia and the bearing of the evidence on the question of recurring Ice Ages, by Prof. Hughes. Prof. Hughes exhibited some specimens and photographs given to him by Prof. David of the University of Sydney, pointing out that the glaciation of South Australia as generally understood had been entirely disproved; that there had been no glaciers in the district in question, but that the traces of glaciation were due to ice floating from the south over a subsiding area, with, as he inferred, a compensating elevation elsewhere. He gave a *résumé* of the new evidence which he had collected in favour of the view that the recurrence of local glacial conditions was always connected with movements of elevation and depression, and appealed to physicists to explain the overthrusts and contortions of the surface of the earth, not solely by shrinkage of the nucleus nor by deformation of the whole mass, but by some conditions affecting regions limited in extent and depth, with perhaps a certain amount of periodicity determined by some more general cosmical causes.—On some chipped flints from the higher plateau gravel of Salisbury, by Prof. Hughes. Prof. Hughes criticised the evidence which had been adduced in favour of the discovery of man older than the Palæolithic Age, exhibiting in illustration a collection of so-called Palæotoliths from the plateau gravels near Salisbury, from the stony surface between Six-Mile Bottom and Balsham, and from Kent. As far as he had seen, no satisfactory evidence had been adduced in favour of the higher antiquity assigned, in the case of any of the flints which could be said to bear marks of design.—On the leakage of electricity through dielectrics traversed by Röntgen rays, by Prof. J. J. Thomson and Mr. J. A. McClelland. This paper contains an account of a series of experiments made with the object of investigating the laws regulating the passage of electricity through dielectrics transmitting Röntgen rays. This phenomenon has been discussed by one of the authors in a paper read before the Philosophical Society on January 27, and also in one read before the Royal Society on February 13. The first experiments relate to the rate of leak through different gases under similar conditions as to pressure and potential gradient. The gases used were hydrogen, ammonia, carbonic acid, air, coal gas, sulphuretted hydrogen, chloroform, chlorine, bromine, iodine, sulphur chloride and mercury vapour. Numbers showing the rate of leakage in these gases relatively to that in air are given. In general, though the rule is not without exceptions, the greater the molecular weight of the gas the more rapid the leakage. In hydrogen the leak was slowest, and in mercury vapour fastest; the rate in the vapour of boiling mercury was about twenty-eight times as fast as hydrogen. The rapid rate in mercury vapour is interesting, for this gas offers great opposition to the passage of an ordinary electric discharge. The rate of leak in the halogens is also very rapid, and a tube containing a charged plate in chlorine gas is a very sensitive and convenient method of measuring the intensity of these rays. The rates of leakage in air at different pressures were investigated; it was found that the rate of leak was slower at a low pressure than at a high one, and was over a considerable range of pressure approximately proportional to the square root of the pressure. The effect of temperature was also investigated, and it was found that through air the rate of leak was slower at a very high temperature than at the temperature of the room, but there was an intermediate temperature at which the rate was a maximum. The most remarkable thing about this leakage under the influence of these rays is that the rate is almost independent of the potential difference. Thus when the high potential plate was 5 volts above that of the low, the rate of leak was appreciably greater than when the potential difference was 1 volt, but the rate was no greater when the potential difference was 500 volts than when it was 5. A series of experiments were made to find how the rate of leakage varied with the distance from the bulb; the bulb was placed behind a metal plate with a hole in it: it was found that in the neighbourhood of the phosphorescent glass the reciprocal of the rate of leakage was a linear function of the distance from the phosphorescent patch, but at greater distances it diminished more rapidly than is indicated by this law. The measurements are not inconsistent with the view that the rate varies inversely as the square of the distance from a place in the neighbourhood of the *negative electrode*. Some experiments on the rate of leakage produced by the rays after passing through a varying number of strips of tinfoil seem to indicate that these rays are not all of one kind.

DUBLIN.

Royal Dublin Society, January 24.—Prof. George F. Fitzgerald, F.R.S., in the chair.—The following papers were read:—On carborundum, a substitute for emery, by Dr. Charles E. Fitzgerald; some remarks on difficulties of meridian circle work, by Mr. Arthur E. Lyster; a method of using common petroleum as the illuminant for beacons and buoys, by which a continuous light for weeks or months may be maintained day and night, without the necessity for the attendance of a light-keeper, by Mr. John R. Wigham At this meeting, Prof. D. J. Cunningham, F.R.S., exhibited and described puppies of the Cape hunting dog (*Lycaon pictus*), preserved in spirit. The animals were born in the Royal Zoological Gardens, Dublin.—Mr. Richard J. Moss described acetylene, the new illuminant.

February 19.—Prof. G. F. Fitzgerald in the chair.—The following two papers were read:—On Hamilton's singular points and planes on Fresnel's wave-surface, by Prof. William Booth, of Hoogley College, Bengal, communicated by Prof. Thomas Preston; on the continuity of transformation from the liquid to the gaseous state, by Prof. Thomas Preston.—There were exhibited at this meeting the Lenard-Röntgen X-rays, and their properties were described by Dr. J. Joly, F.R.S., photographic results being exhibited by Dr. Joly, Mr. W. E. Wilson, and Mr. Richard J. Moss.

PHILADELPHIA.

Academy of Natural Sciences, February 25.—Papers under the following titles were presented for publication: "The Colouring Matter of the Axil of *Celastrus scandens*," by Ida A. Killer; "The Crystallisation of Molybdenite," by Amos P. Brown. The Anthropological Section having precedence, Dr. D. G. Brinton made a communication on the use of the cranio-facial line in determining racial and individual characters on the living subject. The relation of the diameters of the cranium formerly relied on had been found unsatisfactory. He specially recommended a line closely resembling that suggested by the sculptor Charles Rochet. It connects the two auditory foramina, forming a slight curve, the superior border of which connects the internal commissures of the eyes. This line, it is claimed, divides the ideal, normal head into two perfectly equal parts, although in nature, of course, this proportion is not maintained, but varies as a racial character and in individuals. The relations of the lines may also indicate the cranial capacity, as the plane of the curve continued posteriorly is approximately the base of the skull. He further pointed out that the distance between the distal extremities of the curve gives the width of the head and the face; and that a series of curves, described from the fixed points indicated, offers, probably, the simplest and most accurate method of obtaining significant head-measures on the living subject.—Dr. Harrison Allen commented on the difficulty of obtaining satisfactory cranial measurements, and referred to Oldfield Thomas's, taken from the outer margin of the orbits to determine the projection of the nose. He did not think the true horizontal plane of the skull could be fixed. The so-called Frankfurt plane is the one most commonly accepted.—Dr. Seneca Egbert stated that he had demonstrated the action of the X-rays through plates of platinum from ordinary sunlight. Illustrative pictures were exhibited, and the published results of other experimenters were discussed.—Prof. Maxwell Summerville exhibited beautiful specimens of chipped arrow-heads made from common green bottle-glass by the natives of North-western Australia. He also called attention to a stone carved to resemble a miniature grotesque head, from the valley of the Delaware, opposite Milford, and an object used in phallic worship by the natives of Poonah, India.—Dr. D. G. Brinton called attention to the importance of obtaining systematic data for the study of American anthropology, and suggested the wide distribution, under the auspices of the Anthropological Section of the Academy, of circulars of inquiry, similar to those in use by the Committee appointed by the British Association for the Advancement of Science for the study of the ethnography of Great Britain.

March 3.—Messrs. Morris E. Leeds and J. S. Stokes, on behalf of Messrs. Queen and Co., made communications on the historical development of studies in connection with Röntgen photography, presented the most advanced views as to the nature of the X-rays as published by various investigators. They also exhibited a series of fine pictures illustrating the application of the process to the study of biology, and the results obtained by the use of quick and slow plates and various developers. Dr. Egbert having alluded to

the results obtained by him from the direct rays of the sun through platinum plates, Mr. Leeds called attention to the desirability of experimenting with the sun's rays reflected from a mirror. If a positive result be obtained, it would demonstrate either that Röntgen rays can be reflected, or that those producing Dr. Egbert's effects are not Röntgen rays.—Mr. J. Willcox presented a collection of 308 recent and fossil Fulgurs from various localities and geological horizons, illustrating with extraordinary completeness the evolution of the forms.—A preliminary announcement was made of the presentation by Mr. A. Donaldson Smith of fine collections of mammals, birds, reptiles and insects, made by him during his recent exploration of Western Somaliland, Africa.

PARIS.

Academy of Sciences, March 6.—M. A. Cornu in the chair.—The President announced to the Academy the death of M. Sappey, Member of the Section of Anatomy and Zoology.—On the underground pendulum of the Paris Observatory, by M. F. Tisserand. The pendulum is buried to a depth of twenty-seven metres, where its temperature does not vary by more than '01° to '02° during the year. Although an attempt was made to keep the pressure of the air round the pendulum constant, the variations in rate were found to follow the variations in the atmospheric pressure.—On a new carbide of zirconium, by MM. H. Moissan and Lengfeld. An account of a second zirconium carbide, ZrC; distinguished from the carbides of allied metals by not reacting with water either at 0° or 100° C.—Actinometric observations made at the Observatory of Montpelier in 1895, by M. A. Crova.—On a log with instantaneous readings, by H. A. Coret.—On the errors in astronomical instruments caused by variations of temperature, by M. Hamy.—On uniform functions defined by the inversion of total differentials, by M. P. Painlevé.—On the principle of an accumulator for light, by M. C. Henry.—On lunar barometric waves and the secular variation of the climate of Paris, by M. P. Garrigou-Lagrange.—Cryoscopic researches, by M. A. Ponsot. Data are given for the limiting values of the molecular lowering of the freezing point of water for ten salts.—On the structure and constitution of the alloys of copper and zinc, by M. G. Charpy.—On the *rôle* of alumina in the composition of glass, by M. L. Appert. The introduction of alumina into glass tends to prevent devitrification, and allows of a considerable quantity of lime to be present.—The constitution of rhodinol, by MM. P. Barbier and L. Souveault. From a study of its oxidation products rhodinol is shown to be a primary unsaturated alcohol.—Explanation of the cruciferous flower from its anatomy, by M. O. Lignier.—On the geological constitution of the strata in the vicinity of Heraclea (Asia Minor), by M. H. Douville.—On a meteorite that fell near Fisher (Minnesota) on April 9, 1894, by M. N. H. Winchell. This meteorite consists chiefly of olivine and enstatite, together with small quantities of iron, troïlite, tridymite, and maskelynite.—On the meteor of February 10, 1896 (Madrid), by M. Miguel Merino.—On a meteor represented by Raphaël in his "Madone de Foligno," by M. P. Masson.—A confirmation of the results of M. Le Bon on dark light, by M. Ellinger.—On some experiments demonstrating the action of the Röntgen rays on fluorescent bodies, by M. G. Campos.—On a point in the kinetic theory of gases, by M. Chapel.

BERLIN.

Meteorological Society, February 4.—Prof. Börnstein, President, in the chair.—Prof. Zuntz spoke on mountain-sickness, and gave an account of the experiments on respiration he had carried out, in conjunction with Dr. Schumburg, at great altitudes on Monte Rosa. He found that when resting the consumption of oxygen was greater than at lower levels, but not very markedly so, and differed with different individuals. During work, which consisted in climbing a steep incline, the amount of oxygen consumed was per kilogramme-metre of work nearly three times as great, indicating a correspondingly increased expenditure of energy. In accordance with the above, the so-called mountain-sickness cannot be due chiefly, if at all, to the diminished partial pressure of oxygen at the higher level. He considered that it is rather the outcome of a lessened cardiac activity brought about by the powerful stimuli of insolation acting on the eyes and skin, by the action of cold, of increased air-currents, and of psychical excitement united to the antecedent fatigue. The deleterious effects of these abnormal stimulations can be lessened, or even done away with, by practice; and the effect of the diminished partial pressure of oxygen, which is observed in the case of some persons, may be prevented by mixing a little (about 2 per cent.) carbon dioxide with the inspired air, since this gas induces somewhat deeper inspirations.

Physiological Society, February 7.—Prof. Zuntz, President, in the chair.—Prof. Goldstein exhibited a series of photographs taken with Röntgen X-rays.—Dr. Abelsdorff spoke on the visual purple of fishes, which shows a maximum in its absorption spectrum differing from that in the similar spectrum obtained from amphibia, birds and mammals. He exhibited a solution of visual purple obtained from fish; it was at first of an obvious violet colour, became speedily yellow under the action of light, and then finally and very slowly colourless. By treating fish-eyes with alcohol and formalin he had obtained preparations which showed the retina of a brilliant purple colour as looked at anteriorly.—Dr. Benda spoke on the regeneration of blood corpuscles in man, and on the structure of the organs therein concerned, as based on serial sections through lymphatic nodules, the spleen, and the marrow of bones. He came to the conclusion that in the nodules the germinal centre, the germinal layer, and the more peripherally placed leucocytes form part of one developmental series. He found similar structures in the spleen, and also that in the marrow of bones the red corpuscles exhibit a similar series.

February 21.—Prof. du Bois Reymond, President, in the chair.—Dr. Frenzel exhibited photographs taken on bromide of silver-paper with Röntgen X-rays. Of these the most interesting was that of a frog taken on twelve sheets of the paper laid one upon the other; the photograph came out equally well defined on each sheet.—Dr. Schulz spoke on the influence of temperature on the working-power of unstriated muscles. He had studied the isotonic and isometric contractions of strips from the muscular layer of a frog's stomach in response to maximal electrical stimuli at temperatures between − 6° and + 45° C. From the temperature of the room onwards the height of circulation increased up to 35°, the tension up to 32°, while at the same time, and up to the same temperatures, the latent period and duration of the contraction diminished. Above these maxima all the phenomena were exactly reversed. At 45° the muscles gave no further reaction, and a temperature of 60° to 65° caused a permanent shortening. On cooling below the temperature of the room, both the height of contraction and the tension diminished progressively, whereas the latent period and duration of contraction increased down to a lower limit of − 5° to − 6° C., at which temperature there was no further reaction. When slowly rewarmed contractions again made their appearance. Between − 8° and − 10° the muscle contracted suddenly and permanently; but this contraction disappeared on slow warming, the muscle now being inert even at higher temperatures. Comparing the striated with the unstriated muscles, Dr. Schulz laid stress on the fact that with a rise of temperature the latter exhibit a gradually increasing efficiency up to the maximal, whereas the former, according to Gad and Heymans, show a secondary minimum at 19°.

Physical Society, February 14.—Prof. du Bois Reymond, President, in the chair.—Prof. Börnstein exhibited photographs of a hand taken directly on to paper by means of Röntgen X-rays.—Prof. von Bezold spoke on balloon voyages from their scientific point of view. Starting with the fundamental physical principles which underlie the events taking place in cyclones and anticyclones as also in the general atmospheric circulation, he proceeded to show the necessity for more exact measurements of temperature and humidity in the upper strata of the air, and of ascertaining the height at which air passes over from a cyclone into an anticyclone. In conclusion, he gave the values of this height as far as they have so far been determined by means of balloon ascents made from Berlin.—Prof. Neesen exhibited specimens of the photographic effects he had obtained by means of kathode rays which were reflected by means of a mirror in the vacuum tube into a lateral tube, and then passed out of the tube through an animal membrane. It was found that a thin glass plate materially weakened the action of the rays, whereas they passed just as readily through the animal membrane as do the Röntgen rays through the fleshy parts of the hand. Prof. Goldstein stated that the Röntgen rays may be concentrated, and hence sharply-defined images obtained, by using as kathode an aluminium disc backed with a glass plate, and nearly filling the vacuum tube.

—Dr. Koehne announced that he had succeeded in obtaining an electrolytic solution of carbon. Using pure carbon as anode, hot sulphuric acid as electrolyte, and platinum as kathode, he observed that the fluid became yellow and then dark brown or black, while at the same time a thin layer of graphite was deposited on the kathode. By means of carbon, hot sulphuric acid, and peroxide of lead, he obtained a galvanic cell, with a resistance of 100 ohms, which gave a current of one volt.

February 28.—Prof. du Bois Reymond, President, in the chair.—Dr. Martens spoke on the magnetisation of horizontal discs rotating in the terrestrial field, and made of various samples of iron, steel, and nickel, explaining how he had measured their magnetism by means of an astatic needle, and giving the values he had obtained.—Mr. Goode exhibited a vacuum tube for the production of Röntgen rays, on to which a system of bulbs and tubes had been fused and partially filled with mercury, so as to admit of the removal of any gases which had collected in the tube.—Mr. H. Starke explained a simple method of determining the electrical constants of solid bodies. It is based on the introduction into one arm of a Wheatstone bridge of a condenser between whose plates fluid mixtures of various dielectrics with varying electrical constants can be placed, and on the finding of a mixture such that when the given solid is immersed in it the constants of the mixture are not altered.—Prof. Lampe exhibited a series of Röntgen photographs taken by Prof. König in Frankfurt a-M., which were remarkable for their sharpness and the shortness of the exposure necessary for their production.—Prof. Rubens demonstrated Hertzian vibrations whose wave-length was 4½ cm., and which, after being made parallel by means of a glass lens, were then polarised by the use of a set of three glass discs.

NEW SOUTH WALES.

Linnean Society, November 27, 1895.—Mr. Henry Deane, President, in the chair.—On some developments of the mammalian prenasal cartilage, by R. Broom.—On a small fossil diprotodont marsupial, with large grooved premolars, by R. Broom. A more complete description from more perfect specimens of the little fossil marsupial described under the name *Burramys parvus* at the June meeting.—On a small fossil *Petaurus*-like marsupial, by R. Broom. Under the provisional name *Palæopetaurus elegans* was described a small fossil marsupial from a bone-breccia deposit in the neighbourhood of Taralga.—On the organ of Jacobson in an Australian bat (*Miniopterus*), by R. Broom.—Observations on a gravid echidna, by R. Broom.—Stray notes on Papuan ethnology, by C. Hedley. An interesting carved figure-head, of the bird and crocodile design, "geroma," from a village in Bentley Bay, British New Guinea, was described. It was interesting as setting at rest the identity of the bird, a cassowary, which Prof. Haddon had in his monograph been unable to determine. He also described an ingenious palm-leaf basket "porha" in common use among the natives of Eastern British New Guinea.—On an undescribed structure in the leaves of certain plants, by Alex. G. Hamilton. In this paper was given a detailed account, with figures, of certain structures which have been found to be present in the leaves of more than thirty species of plants referable to various natural orders, respecting which the text-books and other literature available, beyond an incidental allusion or two, seem to furnish little or no satisfactory information. In their most complete form the structures in question appear as hair-lined cavities in the leaf substance, situated in the axils of the primary or secondary veins, and opening to the exterior on the under-surface of the leaf by a small opening with a thickened rim (as in *Pennantia Cunninghamii*, Miers, and *Coprosma lucida*. Experimental evidence was adduced against the view that they are catchment hollows for water; and the author was led to think that they were structures once useful, but now no longer functional, and in course of disappearing.—Preliminary note on the occurrence of a placental connection in the bandicoot (*Perameles obesula*); and on the fœtal membranes of certain macropids, by Jas. P. Hill.—Notes on the eucalypts of New South Wales (No. 1), by Henry Deane and J. H. Maiden. The authors having for a considerable period made a special study of the eucalypts of this colony, both in the field and from dried specimens, gave the results of a series of observations in regard to the botanical structure, geographical distribution, &c., of a number of species belonging to the *Renantheræ*.—Descriptions of some new Australian plants, by J. H. Maiden and R. T. Baker.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

BOOKS.—The Glaciers of the Alps: J. Tyndall, new edition (Longmans).—Proceedings of the London Mathematical Society, Vol. xxvi. (Hodgson).—The Hymenoptera Aculeata of the British Islands: E. Saunders (L. Reeve).—Moorland Idylls: Grant Allen (Chatto).—The Whence and Whither of Man: Prof. J. M. Tylor (New York, Scribner).—Statesman's Year-Book, 1896 (Macmillan).—Single-Salt Analysis: B. P. Lascelles (Sonnenschein).—Geschichte der Explosivstoffe: S. J. von Romocki. II. Die Rauchschwachen Pulver (Berlin, Oppenheim).—Fear: A. Mossó, translated by E. Lough and F. Kiesow (Longmans).—Historical and Future Eclipses: Rev. S. J. Johnson, new edition (Parker).—Elements of the Theory of Functions of a Complex Variable: Dr. H. Durège, translated by Drs. Fisher and Schwatt (Philadelphia, Fisher).—Ostwald's Klassiker der Exakten Wissenschaften, Nrs 72, 73, 74, 75 (Leipzig, Engelmann).—Lehrbuch der Anatomie des Menschen: Prof. C. Gegenbaur, 2 Vols. Sechste Verbesserte Auflage (Leipzig, Engelmann).—From the North Pole to Equator: A. E. Brehm, translated (Blackie).—Elementary Practical Chemistry: G. S. Newth (Longmans).—Researches on Mimicry on a Basis of a Natural Classification of the Papilionidae: Dr. E. Haase, translated by Dr. C. M. Child, Part 2 (Stuttgart, Nägele).—Atlas of Nerve Cells: Drs. Starr, Strong, and Leaming (Macmillan).—Handbook of Jamaica for 1896 (Stanford).—Calcul du Temps de Pose en Photographie: H. Boursault (Paris, Gauthier-Villars).—Géométrie Descriptive: A. Gouilly (Paris, Gauthier-Villars).—A Fauna of the Moray Basin: J. A. Harvie-Brown and T. E. Buckley (Edinburgh, Douglas).

PAMPHLETS.—Report for 1895 on the Lancashire Sea-Fisheries Laboratory at University College, Liverpool (Liverpool).—Démonstration de l'Axiome XI. d'Euclide: M. Frolov (Paris, Michelet).—Royal Gardens, Kew. Hand-list of Conifera grown in the Royal Gardens (Eyre).—Typhoon Highways in the Far East. No. 1. Across the South End of Formosa Strait (Zi-Ka-Wei).—On the Application of the Law of Similarity to Marine Propellers: J. D. Young (Newcastle-on-Tyne).—The San Jose Scale: L. O. Howard and C. L. Marlatt (Washington).—Observations Météorologiques, Magnétiques et Hydrométriques de l'île de Danemark dans le Scoresby Sound, 1891–92 (Copenhague).

SERIALS.—Zeitschrift für Wissenschaftliche Zoologie, lxi. Band, 2 Heft (Williams).—Académie des Sciences de l'Empereur François Joseph I. Bulletin International Classe des Sciences Mathématiques et Naturelles, II. (Prague).—American Journal of Science, March (New Haven).—Journal of the Western Society of Engineers, January, and Supplement (Chicago).—Journal of the Institution of Electrical Engineers, March (Spon).—Journal of the Franklin Institute, March (Philadelphia).—Psychological Review, March (Macmillan).—Transactions of the Astronomical and Physical Society of Toronto, 1895 (Toronto).—Bulletin de l'Académie Royale des Sciences, &c., de Belgique, 1896, No. 2 (Bruxelles).—Memoirs and Proceedings of the Manchester Literary and Philosophical Society, Vol. x. No. 1 (Manchester).—Astrophysical Journal, March (Wesley).—Royal Natural History, Part 29 (Warne).—L'Anthropologie, tome vii. No. 1 (Paris, Masson).—Economic Journal, March (Macmillan).—Timehri, December (Stanford).—Imperial University, College of Agriculture Bulletin, Vol. ii. No. 5 (Tōkyō).—Himmel und Erde, March (Berlin, Paetel).—Trans. R. S. Edin., Vol. xxxviii. Part 2 (No. 9): Specific Gravities and Oceanic Circulation: Dr. A. Buchan (Williams).—American Naturalist, March (Philadelphia).—Journal of the Anthropological Institute, February (Paul).—Das Tierreich, Probe-Liefg., Heliozoa: Dr. F. Schaudinn (Berlin, Friedländer).—Physical Review, Vol. iii. No. 5 (Macmillan).

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