

the proper place of the 'symmetric function tables' as studied by Hirsch, Cayley, Durfee, and others, in the algebra of such functions; to point out that the fact of their existence depends upon a wide theorem of algebraic reciprocity which leads to an equally wide theorem of algebraic expressibility, and that they are a particular case, and not the most important case from the point of view of application, of a system of such tables" (pp. 1-36).—Prof. W. W. Johnson contributes a paper on the integrals in series of binomial differential equations (pp. 37-54). "Binomial equation" is here used in Boole's sense.—Some interesting geometrical results are given in the next paper, by M. d'Ocagne, "Sur certaines courbes qu'on peut adjoindre aux courbes planes pour l'étude de leurs propriétés infinitésimales" (pp. 55-70).—Prof. Cayley closes the number with an instalment on the surfaces with plane or spherical curves of curvature (pp. 71-98). The paper is a reproduction in a compact form, with additional developments, of papers by Bonnet (*Journal de l'École Polyt.*, t. xx., 1853, pp. 117-306), and Serret (*Liouville*, t. xviii., 1853, pp. 113-162).

Engler's Jahrbücher, vol. viii. Part 5, contains:—Contributions to the knowledge of the Cupuliferæ, by K. Prantl. The author concludes that the segments of the cupule are not themselves leaves, but outgrowths of the axis covered with leaves, and that, with the exception of this peculiarity, the male and female catkins are similarly constructed. His views will be stated in Engler's "Die Natürliche Pflanzenfamilien," for which this paper was a preparatory study.—A revision of Bentham and Hooker's "Genera Plantarum," and "Floræ Columbiae specimina selecta," by H. Karsten.—The rest of the number is taken up with abstracts of botanical papers, and the list of the more important works on classification and geographical botany published in the year 1886.

Vol. ix. contains the following articles:—On the roots of the Araceæ, by Max Lierau. An investigation of the roots of about 130 species from 46 genera of this natural order, leads the author to the result that those histological characters by which the stem and leaf of the several sub-orders of Engler are distinguished recur also in the roots, and thus these organs, though performing the most various physiological functions, have constant characters of systematic value.—In his contributions to the knowledge of the Capparidaceæ, Dr. Ferd. Pax discusses the questions of (1) the part taken by the axis in the construction of the flower; (2) the relation of the Capparidoideæ to the Cleomoidæ, in respect of the androecium. He concludes that the disk, androphore, and gynophore, are of axial nature, and not the result of coalescence of sporophylls; further, that the construction of the androecium is uniform throughout the order, being based upon the presence of two dimerous whorls, increased often very greatly by duplication.—Observations on the organization and biological conditions of northern trees, by F. W. C. Areschoug.—Specilegium canariense, by H. Christ.—Dr. Marloth gives an interesting account of the morphology, anatomy, and biology of the *Naras* (*Acanthosicyos horrida*, Welw.) of the south-west coast of Africa, and of observations of the peculiar property of the fruit in promoting the coagulation of milk.—On the flora of the German East-Asiatic Protectorate, by K. Schumann.—Contributions to the morphology and classification of the Ranunculaceæ, by K. Prantl. The author distinguishes "honey-leaves" (*Honigblätter*) from the perianth, defining them as "floral leaves, the chief function of which is the secretion of honey, and which have been produced from stamens independently of the differentiation of the perianth into calyx and corolla"; thus he would describe the corolla of *Ranunculus* as consisting of such "honey-leaves," while the calyx would be regarded as a simple perianth. The greater part of the paper is occupied by the classification of the species within the genera.—New contributions to the flora of Greenland, by Eug. Warming.—Contributions to the knowledge of the walnut (*Juglans regia*, L.) by Dr. M. Kronfeld, with two plates.—A posthumous paper, by Dr. Hillebrand, descriptive of the vegetation of the Sandwich Islands.—Orchidaceæ herbarii Dom.-J. Arechavataetæ det. et descr., by F. Kränzlin.—Dr. A. Breitfeld, in a paper on the anatomical structure of the leaves of the Rhododendroidæ, attempts to rank anatomical details with the characters of flower and fruit in the classification of the group, and finds the most useful characters in the epidermis.—On continuous and saltatory variation, by Franz Krašan.—Biographical notices on some of the collectors and authors named in the "Plantæ Rydleanæ," by F. von Herder.—Marine Algæ of Puerto-Rico, by Dr. F. Hauck.

—In addition to the above original treatises, the volume for the year contains a list of the papers of 1887 on the classification, description, and geological distribution of plants, as well as abstracts of the most important of these.

SOCIETIES AND ACADEMIES.

SYDNEY.

Linnean Society of New South Wales, July 25.—Dr. J. C. Cox, Vice-President, in the chair.—The following papers were read:—The insects of King's Sound and its vicinity, part 2, by William Macleay. This paper contains a list of all the Lamellicorn insects in the collection made by Mr. Froggatt in the West Kimberley district. Of the seventy-six species recorded, fifty-nine are described as new, but are all referable to known genera. The genera most numerous in species are *Onthophagus* and *Heteronyx*. The sub-family *Cetoniidae* is represented by four species only.—Catalogue of the known Coleoptera of New Guinea, &c., part 2, by George Masters, Curator of the Macleay Museum. Part 2 of this catalogue, comprising the Tetramerous and Trimerous divisions, amounting to about 1100 species, completes the list of Coleoptera hitherto described from the region under consideration. The total number of species recorded is 2079.—Malaysian land and fresh-water Mollusca, by Rev. J. E. Tenison-Woods. After some introductory remarks on the extent and physical geography of the region under consideration, and on the characteristic features of its land and fresh-water Mollusca, the author gives a list of about 400 species indigenous to the Malay Peninsula in the States south of Keddah, and the Indian Archipelago, not including the Philippines and New Guinea. A bibliographical list is appended.—Mr. Ogilby exhibited a specimen of a deep-sea fish (*Chlorophthalmus nigripennis*), originally described by Dr. Günther in the *Ann. of Nat. Hist.*, 1878, and figured in vol. xxii. of the "Challenger Reports." The original specimens were taken by the *Challenger* naturalists off Twofold Bay, in 120 fathoms; the specimen exhibited was captured quite recently off Port Jackson in 70 fathoms, the only other occasion on which the species has been met with since its discovery.—Mr. Ogilby also exhibited a photograph of *Acanthias Blainvillii*, not hitherto recorded from New South Wales, and one of a variety of *Acanthoclinus littoreus*, originally described by Forster in "Cook's Voyage," the former having been taken in deep water off Port Jackson, the latter under stones between tide-marks at Lord Howe Island.—Mr. Brazier exhibited a spherical stone, about $\frac{1}{2}$ inch in diameter, found in the crop of a Goura pigeon (*G. Albertsi*, Salvad.), from Hall Sound, New Guinea. Also a tube of fresh-water shells (*Segmentina australiensis*, E. A. Smith), from Waterloo Swamps.—Mr. MacDonald showed under the microscope an interesting exhibit of Rotifers (*Megalotrocha* sp.), living in clusters on pond weed.—Mr. Burnell exhibited two living slow-worms (*Typhlops nigrescens*), from Wentworthville, near Parramatta.—Mr. Deane exhibited a remarkable excrescence on a root of *Monotoca elliptica*, found by Mr. J. F. Fitzhardinge in the neighbourhood of Sydney; a specimen of an apodal lizard (*Delma impar*) found by Mr. C. F. Price, of Arable, near Cooma, where the species is said to be abundant in basaltic country; and examples of concretionary nodules occurring abundantly in a slaty rock in a cutting near Bredbo on the Goulburn to Cooma Railway.

PARIS.

Academy of Sciences, October 1.—M. Des Cloizeaux in the chair.—Relative values of the two constituents of the force displayed in the stroke of a bird's wing, deduced from the direction and insertion of the fibres of the great pectoral muscle, by M. Marey. Of the forces in question, one, as shown in previous communications, equals the weight of the bird and enables it to resist gravitation, the other is horizontal and enables it to resist the air. From a study of the disposition of the muscular fibres of the breast, the author now infers that the latter force, contrary to the general opinion, is much greater, and may even be double that of the former.—Positions of Barnard's comet (September 2, 1888) measured at the Observatory of Besançon with the 0.22 m. equatorial, by M. Gruey. The observations cover the period from September 5-15.—Observations of Sawyer-

thal's comet (1888, I.) made with the 0.38 m. equatorial at the Observatory of Bordeaux, by MM. G. Rayet and Courty. The observations range from April 4 to July 12.—Potential energy of the gravitation of a planet, by M. O. Callandreu. The object of this note is to show that the potential energy of a planet's gravitation—in other words, the power of attraction displayed in drawing the molecules from boundless space to their present position—may be approximately calculated if its dimensions, mass, and angular velocity of rotation be known, irrespective of the law of internal densities.—On actino-electric phenomena, by M. E. Bichat. The passage of electricity of high or feeble tension is known to be greatly facilitated when the electrified body is illumined by very refrangible radiations. In a previous communication it was shown that in Stoletow's experiment the substitution of a sheet of water for the metallic plate produces no deviation of the galvanometer, which seems to prove that the electricity is not transmitted by conduction. This inference is confirmed by the experiments here described.—On some new electric phenomena produced by radiations, by M. Auguste Righi. In continuation of previous researches, the author here reports a series of further results connected with the same order of phenomena.—On the employment of the sulphite of soda in photography, by M. Paul Poiré. The process here described has the advantage of avoiding the cloudiness produced by the prolonged action of the carbonate. Plates left forty-five minutes in the bath acquire a continual increase of intensity without presenting the least appearance of cloudiness.—On the land locomotion of reptiles and four-footed Batrachians compared with that of Mammalian quadrupeds, by M. G. Carlet. The locomotion of frogs, toads, lizards, and the like is described as a peculiar action, somewhat analogous to the trot of quadrupeds, and exactly like that of two men walking one behind the other with *contrary* step. It is a sort of slow trot, without any suspension of the body in the air.—M. Carlet communicates a supplementary paper in illustration of the same subject, on the locomotion of an insect rendered tetrapod by deprivation of the two middle legs. The experiment explains the persistence in all these organisms of the six legs, which appear to be not merely useful, but even necessary to secure stability and rapid locomotion.—A series of papers are contributed by MM. Philippe Thomas, P. Fliche, and Bleicher, on the petrified vegetation of Tunis. These fossils are shown to belong to the same Pliocene formation, and to be otherwise closely analogous to the well-known petrified forests in the neighbourhood of Cairo. Specimens of a like character have been picked up in Algeria and other parts of Mauritania, rendering it highly probable that the whole of North Africa, from the Mediterranean to the verge of the Sahara, was covered with a somewhat uniform vegetation in Pliocene times.

STOCKHOLM.

Royal Academy of Sciences, September 12.—Demonstration of a proposition, which touches upon the question of the stability of the planetary system, by Prof. Gylden.—The same exhibited a calculating machine made by Herr Sörensen.—On a paper by Baron von Camerlander in Vienna, on the fall of meteoric dust in some parts of Austria in February this year, by Baron Nordenskiöld.—The same exhibited a new mineral from Pojsberg, which he had named Brandtit.—On crystals of native lead from Pojsberg, by Herr A. Hamberg.—On two new chlorides of indium, and on the density of the vapour of the chlorides of indium, gallium, iron, and chromium, by Profs. Nilsson and Pettersson.—On the theory of the numbers and functions of Bernoulli, based on a system of functional equations, by Dr. Berger.—On change of the sea-level at Altenfiord, by Commodore Littichöök.—On some definite integrals, by Dr. C. F. Lindman.—Contributions to the theory of a singular solution of a partial differential equation with two independent variables, by Dr. J. Möller.—Observations on the condensation of the vapour of water in a humid, electrical atmosphere, by Herr G. A. André.—On a species of Annelida living with hermit crabs, by Dr. Wirén.—On some derivatives of α - β -dichlor-naphthaline, by Herr P. Hellström.—On the former occurrence of *Felis catus* in Scania, by Prof. Qvenerstedt.—On Dahllit, a new mineral from Bamle, in Norway, by Prof. W. C. Brögger and Herr H. Bäckström.—On the freezing-point of dilute aqueous solutions, by Dr. S. Arrhenius.—Galvanometric measurements on the influence that is exercised by an electric spark on another spark, by Dr. C. A. Mebius.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

Untersuchungen zur Morphologie und Systematik der Vögel; I. Spezieller Theil, II. Allgemeiner Theil: Max Fürbringer (T. Van Holkema, Amsterdam).—Fossils of the British Islands: Vol. i. Palaeozoic: R. Etheridge (Clarendon Press).—A Class-book of Elementary Chemistry: W. W. Fisher (Clarendon Press).—General Report on the Operations of the Survey of India Department during 1886-87 (Calcutta).—Fourfold Root and Will in Nature: A. Schopenhauer (Bell).—University College, Liverpool, Calendar for the Session 1888-89 (Holden, Liverpool).—Papers and Proceedings of the Royal Society of Tasmania for 1887 (Tasmania).—Laboratory Manual of General Chemistry: R. P. Williams (Ginn, Boston).—An Introduction to Practical Inorganic Chemistry: W. Jago (Longmans).—Les Formes du Terrain, Texte et Planches: G. de la Noë and E. de Margerie (Paris).—The International Annual of Anthony's Photographic Bulletin (Greenwood).—A Catalogue of the Moths of India, Part 3: E. C. Cotes and C. Swinhoe (Calcutta).—Sixth Annual Report of the Fishery Board for Scotland, for the year 1887: Three Parts (Edinburgh).—Instruction in Photography: eighth edition: Captain W. de W. Abney (Piper and Carter).—The Metallurgy of Gold: M. Eissler (Lockwood).—Key to Lock's Arithmetic for Schools: Rev. R. G. Watson (Macmillan).—Report on the Eruption of Tarawera and Rotomahana, N.Z.: A. P. W. Thomas (Wellington, N.Z.).—Die Schwankungen der Hocharmenischen Seen Seit 1800: Dr. R. Sieger (Wien).—Bulletin du Comité International Permanent pour l'Exécution Photographique de la Carte du Ciel, 2e Fascicule (Gauthier-Villars, Paris).—Die Fossile Pflanzen-Gattung Tylocladon: H. Potonié (Berlin).—Ueber den Einfluss niedriger Sauerstoffpressungen auf die Bewegungen des Protoplasmas: J. Clark (Berlin).—Der Feuerstoff: L. Mann (Berlin).—The Minerals of New York County, U.S.A. (New York).—Journal of the Chemical Society, October (Gurney and Jackson).—Bulletin de l'Académie Impériale des Sciences de St. Pétersbourg, tome xxxii. Nos. 2 and 4.

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