new species of Scitamineæ from the Malayan peninsula, including a new genus, *Lowia*.—Prof. T. Caruel has a note on the fruit and seeds of the cacao.—P. Severino describes the variety *purpurea* of *Aceras anthropophora*, and the micro-chemical reactions of the purple cells.—Two teratological papers complete the list: on viviparity and prolification in *Spilanthes caulirrhiza*, by Dr. F. Tassi; and teratological notes (on *Aegle sepiaria*, *Lysimachia ephemerum*, and *Saxifraga crassifolia*), by C. Massalongo.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, December 16.—"On a Varying Cylindrical Lens." By Tempest Anderson, M.D., B.Sc. Communicated by Prof. A. W. Williamson.

The author has had constructed a cylindrical lens in which the axis remains constant in direction and amount of refraction, while the refraction in the meridian at right angles to this varies continuously.

A cone may be regarded as a succession of cylinders of different diameters graduating into one another by exceedingly small steps, so that if a short enough portion be considered, its curvature at any point may be regarded as cylindrical. A lens with one side plane and the other ground on a conical tool is therefore a concave cylindrical lens varying in concavity at different parts according to the diameter of the cone at the corresponding part. Two such lenses mounted with axes parallel and with curvatures varying in opposite directions produce a compound cylindrical lens, whose refraction in the direction of the axes is zero, and whose refraction in the meridian at right angles to this is at any point the sum of the refractions of the two lenses. This sum is nearly constant for a considerable distance along the axis so long as the same position of the lenses is maintained. If the lenses be slid one over the other in the direction of their axes, this sum changes, and we have a varying cylindrical lens. The lens is graduated by marking on the frame the relative position of the lenses when cylindrical lenses of known power are neutralised.

Lenses were exhibited varying from 0 to − 6DCy, and from 0 to + 6DCy.

Linnean Society, December 16.—W. Carruthers, F.R.S., President, in the chair.—H.R.H. the Prince of Wales was elected an Honorary Member of the Society.—Messrs. A. Bawtree, F. Justen, T. N. Mukharji, F. W. Oliver, and R. V. Sherring were elected Fellows, and G. Nicholson an Associate, of the Society.—The President announced that Sir George MacLeay, K.C.M.G., had presented to the Society a portrait of the late Rev. W. Kirby, the distinguished entomologist, and the manuscripts and correspondence of his father, Alexander MacLeay (elected F.L.S. 1794), formerly Secretary to the Society. For these acceptable donations, a special vote of thanks was accorded by the Fellows.—Prof. F. O. Bower exhibited a series of photographs illustrating the vegetation of Ceylon.—Mr. E. A. Heath showed a stormy petrel, *Procellaria pelagica*, which was picked up alive in Kensington Gardens on December 9; the bird evidently having been driven inland by the great storm of the previous day.—Mr. D. Morris drew attention to the fresh leaves, and the fibres extracted therefrom, of *Agave salmdyckia* and *A. Ixtli*.—Mr. W. T. Thiselton Dyer showed one of the volumes of "Honzo Zufu" ("Illustrations and Brief Descriptions of the Plants of Japan"), by Iwasatti Tsanemasa, which consists of ninety-six volumes containing 2000 coloured figures. Only two or three copies of this important botanical work are known to be complete, as a great part of it only exists in the original native hand-work.—The President exhibited a spike of maize from an ancient Peruvian grave, also samples of prehistoric wheat from ancient British and Romano-British burial-mounds in Wiltshire.—Mr. G. J. Romanes read a paper on the sense of smell in dogs, a report of which we hope to give in a future number.—Mr. C. T. Druery gave a communication on a new instance of apospory in *Polystichum angulare*, var. *pulcherrimum*. He infers that the formation of the prothallus is preceded by a very different series of phenomena from those already recorded. In the one case the prothalli are simple extensions of the cellular substance of the tips of the pinnules commencing at points quite beyond the venation, and produce no root-hairs unless brought into contact with the soil. In the other case, however, the prothallus is a direct outgrowth of the tip of a veinlet, and at once produces root-hairs in abundance long before it assumes any other characteristic of a prothallus, and finally the resulting prothallus is much thicker in substance.—A paper was read on apospory and allied phenomena, by Prof. F. O. Bower. The term "sporal arrest" is applied to all cases where such spores do not come to functional maturity. The arrest is often, but not always, followed by substitutionary or correlative vegetative growths: these take the form of buds, similar to the sporophyte which produced them, and then would be termed cases of "sporophytic budding"; but in other cases the correlative growths may assume the characters of the oophyte or prothallus. Where this happens, the phenomenon is termed "apospory." This direct transition from the sporophyte to the oophyte was *induced* some ten years ago in certain mosses, by Pringsheim and Stahl; and it is now described in detail in two ferns, an *Athyrium* and a *Polystichum*. Both plants were found some years ago growing wild, and the fact of the transition was recognised by Mr. Druery and Mr. Wollaston, and has been already published by the Linnean Society. The present paper describes these and similar phenomena in detail, and shows how in the *Polystichum* at least four different modes of origin of the oophytes may be distinguished, two being in connection with the sorus, while two are at points apart from the sorus, and may even occur on fronds which bear no sori at all. The latter part of the paper is occupied by comparing these phenomena with others already known in higher and lower plants. The general conclusion is that the whole phenomenon of apospory is to be regarded rather as a sport than as a reversion bearing deep morphological conclusions with it.

Chemical Society, December 2.—W. Perkin, F.R.S., Vice-President, in the chair.—Mr. Forbes Rickard was formally admitted a Fellow of the Society.—The following papers were read:—Bismuthates, by M. M. Pattison Muir and Douglas J. Carnegie.—The action of inorganic compounds on living matter, by James Blake, M.D.—Morindin and morindon, by T. E. Thorpe, F.R.S., and T. H. Greenall.—The hydration of salts: cadmium chloride, by S. U. Pickering.—The decomposition of sodium carbonate on fusion, by S. U. Pickering.—Derivatives of tolylbenzene, by Thomas Carnelley, D.Sc. (Lond.), and Andrew Thomson, D.Sc. (Edin.).—The amount of chlorine in rain-water collected at Cirencester, by Edward Kinch, Royal Agricultural College, Cirencester.—Some analogous phosphates, arsenates, and vanadates, by John A. Hall, student in the Laboratory of Owens College.—Agricultural experiments with iron sulphate as a manure during 1886, by A. B. Griffiths, Ph.D.

Royal Meteorological Society, December 15.—Mr. W. Ellis, F.R.A.S., President, in the chair.—Mr. G. R. Farncombe, B.A., Mr. C. E. B. Hewitt, B.A., and Capt. S. Trott were elected Fellows of the Society.—The following papers were read:—On the proceedings of the International Congress of Hydrology and Climatology at Biarritz, by Mr. G. J. Symons, F.R.S. This Congress was held in October, and was divided into three sections, viz. Scientific Hydrology, Medical Hydrology, and Climatology, Scientific and Medical. The total number of papers read was 109. An Exhibition was also held in connection with the Congress. The excursions were of primary importance to the medical men, and extended over a period of three weeks. The places visited were: Bayonne, Cambo, Dax, Arcachon, Pau, Eaux-Bonnes, Eaux-Chaudes, Cauterets, Lourdes, Bagnères-de-Bigorre, Luchon, Ussat, Ax, Montpellier, Cette, Boulou, Amélie-les-Bains, La Preste, Banyuls-sur-Mer, and Thues.—Report on the phenological observations for 1886, by the Rev. T. A. Preston, M.A., F.R.Met.Soc. The weather was, on the whole, very ungenial and everything much retarded; it was also very fatal to insect life, so that the complaints on this head have been far less than usual. Bush fruits were *very* abundant; strawberries and peas were spoilt by drought in many places; stone fruits, except plums, were not abundant; plums were extraordinarily plentiful, so much so that they realised nothing in the markets, the cost of picking and carrying often being more than they realised; apples were very poor, from the destruction of the bloom by heavy rain. Hay was good and plentiful, and well harvested; corn and other grain were not up to an average: root-crops were, as a rule, remarkably good.—A criticism of certain points of Prof. Langley's researches on solar heat, by Prof. S. A. Hill, B.Sc., F.R.Met.Soc. These experiments were carried out at Mount Whitney, in Southern California, during 1881.—Account of the

© 1886 Nature Publishing Group

hurricane of March 3–4, 1886, over the Fiji Islands, by Mr. R. L. Holmes, F.R.Met.Soc. This storm was the most destructive that has ever been known to occur in the Fiji group. The lowest barometer reading was 27·54 inches at Vuna, in Taviuni. The storm was accompanied by a great wave from 18 to 30 feet in height, which swept over the land and caused an immense amount of damage. It was reported that fifty vessels were wrecked and sixty-four lives lost during this hurricane.—Results of meteorological observations made at the Military Cemetery, Scutari, Constantinople, 1866-85, by Mr. W. H. Lyne. The annual mean temperature is 58°·4; the highest temperature registered was 103°·6 on June 22, and the lowest 13°·0, on January 25, both in 1869. The annual rainfall is 29·29 inches; the greatest fall in one day was 4·06 inches on September 25, 1866.

Physical Society, December 11.—Prof. McLeod, Vice-President, in the chair.—W. Natanson, Ed. Natanson, the Hon. R. Abercromby, Jul. Verteimer, and H. M. Elder were elected Members of the Society.—The following papers were then read:—On the influence of change of condition from the liquid to the solid state on vapour-pressure, by Prof. W. Ramsay, Ph.D., and Sydney Young, D.Sc., read by Dr. Young. The authors refer to some experiments published in *Wiedemann's Annalen*, vol. xxviii. p. 400, by W. Fischer, on the above subject, which show that the vapour-pressure of ice and solid benzene are less than those of water and liquid benzene at the same temperatures. By using the formula $p = a + bt + ct^2$ to express the relation between the pressure and temperature of saturated vapours, Fischer arrives at the absurd result that the vapour-pressure of liquid benzene is not identical with that of solid benzene at melting-point. If the above formula be replaced by $\log p = a + bat$, it is shown that the anomaly disappears. The authors have measured the vapour-pressures of solid and liquid benzene by the dynamical method, and obtain results agreeing closely with those of Fischer determined statically. They also calculate the vapour-pressure of solid benzene from that of the liquid, using the formula—

$$P_{t-1} = P - (P't - P'_{t-1})\left(\frac{V_{t-\frac{1}{2}} + F_{t-\frac{1}{2}}}{V_{t-\frac{1}{2}}}\right),$$

where Pt and $P't$ are the vapour-pressures of the solid and liquid at temperature t, $V_{t-\frac{1}{2}}$ = heat of vaporisation of liquid, and $F_{t-\frac{1}{2}}$ = heat of fusion of solid at temperature $t - \frac{1}{2}$. The numbers so obtained are in accordance with those determined experimentally. —On the nature of liquids as shown by the thermal properties of stable and dissociable bodies, by the same authors, read by Prof. Ramsay. From experiments on the vapour-density and heat of vaporisation of stable and dissociable bodies, the authors arrive at two important results: (1) that for stable bodies, such as alcohol and ether, the density of their saturated vapours increases with rise of temperature, whereas for bodies such as acetic acid and nitric peroxide the vapour-density attains a minimum at a certain temperature, and increases with either rise or fall of temperature; (2) the heat of vaporisation of alcohol decreases with rise of temperature, but that of acetic acid attains a maximum at about 110° C., and decreases with rise or fall of temperature. From these results the authors seek to prove that the difference between stable liquids and their vapours consists in the relative proximity of the molecules, this proximity being greater in liquids than gases, and that the molecules of stable liquids are not more complex than those of their gases. Prof. Pickering dissented from this view, and thought that the molecules of liquids are aggregations or compounds of those of the gases. In answer to inquiries by the authors, Mr. Lewis Wright said that bodies which rotate the plane of polarisation of light when in the liquid state also rotate it in a proportionate degree when gaseous; and Capt. Abney remarked that stable liquids and their vapours give similar absorption-spectra, whereas those of dissociable bodies differ considerably. Both these facts seem to support the view put forward by the authors.—An account of Cauchy's theory of reflection and refraction of light, by Mr. James Walker, M.A. This paper is intended as a statement of the work previously done in the subject, and gives references to the original papers and "reproductions," &c., which will be of great value to persons studying this important branch of the theory of optics.—Mr. Shelford Bidwell exhibited and described a voltaic cell, in which the electrolyte is dry peroxide of lead. It consists of carefully dried peroxide placed between plates of lead and sodium, and gives a comparatively strong current, which passes from the sodium to the lead within the cell.

Cambridge

Philosophical Society, November 8.—Mr. Trotter, President, in the chair.—The following communications were made:—On the cœlum and body-cavity of Peripatus and the Arthropoda, by Mr. A. Sedgwick.—Note on the "vesicular vessels" of the onion, by S. H. Vines, M.A. Christ's, and A. B. Rendle, St. John's. In investigating the vesicular organs with the object of determining whether or not the transverse walls are perforated so as to place the cavities of successive segments in communication, the authors observed that, in the quiescent winter condition of the bulb, there are patches of callus—easily made conspicuous by staining with corallin—on the transverse walls. From this they infer that the transverse walls are perforated, the canals through them being open in the active, and closed by callus in the quiescent, condition of the bulb, just as is the case with sieve-tubes. This inference has, however, to be confirmed by an investigation of the bulb in the active condition. The authors also observed that each segment of a vesicular vessel contains a large nucleus.—On *Epiclemmydia lusitanica*, a new species of Alga, by Mr. M. C. Potter. During August and September, the author, with assistance from the Worts Travelling Scholars' Fund, investigated the life-history of a new species of Alga, now named *Epiclemmydia lusitanica*, which lives on the backs of the tortoises inhabiting the pools of Southern Europe. This Alga, which to the naked eye appears as small green roundish patches, is found to consist of a number of cells closely applied to tortoise-shell, but which are only a few layers deep, here and there penetrating into the tortoise-shell and causing it to flake off. The cells next to the tortoise-shell always force their way into any available crack, where they divide, and thus penetrate to some depth into the shell of the tortoise, and finally cause it to be flaked off. The Alga is reproduced by means of zoospores formed in the external layer of cells. These zoospores are all exactly similar, and swim about for a considerable time, after which they come to rest and germinate.—On a peculiar organ of *Hodgsonia heteroclita*, by Mr. Walter Gardiner. The author gave some account of the gland-bearing organs which are found in *Hodgsonia*—one in the axil of each of the foliage leaves. A study of the development of these organs demonstrates that they are peculiarly modified leaves, or rather bracts, since they are associated with the rudimentary flower-bud. They are doubtless identical with the similarly modified bracts which occur in connection with the fully developed flowers. The glands are found on the lower surface of the bract, and belong to the same type as those of *Luffa*, although of a distinctly higher order. Glands of a similar nature also occur on the under surface of the foliage leaves and on the sepals. The substance secreted by the glands is most probably of the nature of nectar, and the whole structures are to be regarded as extra floral nectaries. Having shortly described their histology, the author proceeded to make some remarks upon their function. A careful survey of the various gland-bearing genera of the *Cucurbitaceæ* and *Passifloraceæ*, and a comparison of such cases as those presented by *Passiflora quadrangularis* and *Passiflora fœtida*, placed it, in his opinion, beyond doubt that the function of the extra floral nectaries of the two orders is to attract certain insects—probably ants—which are of service to the plant in protecting it from the attacks of other and harmful insects, such as caterpillars, which are accustomed to creep up the narrow stem for the purpose of devouring or otherwise injuring the young growing shoots. As regards the fertilisation of *Hodgsonia*, the author showed that there were special contrivances to prevent the animal which fed upon the nectar of the flower from obtaining that of the extra floral nectaries, and *vice versâ*, and stated that, considering all the circumstances of the case, it was exceedingly probable that fertilisation was accomplished through the agency of a large night-flying moth.

Edinburgh

Royal Society, December 20.—Sir W. Thomson, President, in the chair.—The Chairman communicated a paper, by the Rev. J. H. Sharpe, on a remarkable case of stream-lines in two-dimensional fluid motion. The body which produces the stream-lines is symmetrical about an axis, and consists of a semicircular head, with another portion the form of which is given by a transcendental equation.—A note on knots, by Mr. A. B. Kempe, was communicated by Prof. Tait. This paper is pre-

© 1886 Nature Publishing Group

liminary to a detailed investigation of knots by an entirely new process.—Sir W. Thomson discussed the ring-waves produced by throwing a stone into water. This investigation constitutes an extension of Poisson's and Cauchy's results. The wave-velocity is directly proportional to the square root of the wave-length, and the group-velocity is one half of the wave-velocity.—Sir W. Thomson also gave an investigation of the waves produced by a ship advancing uniformly into smooth water. His results show that there is practically no disturbance of the surface outside lines drawn from the ship making an angle of 19° 28′ on either side with the direction of motion. When tested by experiment the angle obtained was 19° 13′.—Dr. T. Muir communicated a paper, by Mr. P. Alexander, on the expansion of functions in terms of linear, cylindric, and spherical, &c., functions by a new and very general method.—In a paper on even distribution of points in space, Prof. Tait replied to certain criticisms made on his results regarding the foundations of the kinetic theory of gases.

MANCHESTER

Literary and Philosophical Society, November 2.—Prof. Osborne Reynolds, LL.D., F.R.S., Vice-President, in the chair.—The following papers were read:—Measurements of the magnetic induction and permeability in soft iron, by H. Holden, B.Sc.—The action of hydrochloric acid gas upon certain metals, by J. B. Cohen, Ph.D., F.C.S.—Capillary constants of benzene and its homologues occurring in coal-tar, by J. B. Cohen, Ph.D., F.C.S., all communicated by Dr. A. Schuster, F.R.S.

SYDNEY

Linnean Society of New South Wales, October 27.—Prof. W. J. Stephens, F.G.S., President, in the chair.—The following papers were read:—Catalogue of the described Coleoptera of Australia (part vi.), by George Masters. The present part contains all the known Scolytidæ, Brenthidæ, Anthribidæ, Bruchidæ, and Cerambycidæ of Australia, making the total number of species catalogued up to the present time, 6231. The next part, which will be published early in next year, will complete the Coleoptera.—Descriptions of new Lepidoptera, by E. Meyrick, B.A., F.E.S. In this paper descriptions are given of sixteen new species of Australian Lepidoptera belonging to fourteen genera, of which six are new. Among them is *Thalpochares coccophaga*, of which, at the December meeting of the Society, Mr. Masters exhibited specimens of both moths and larvæ, and called attention to the singular habits of the latter, which feed on a species of Coccus infesting a Macrozamia, living concealed in a cocoon-like shelter formed of the exuviæ of the Coccus, and finally pupating therein.—On the flowering seasons of Australian plants, by E. Haviland, F.L.S. This paper enumerates 113 species of plants observed in flower in the neighbourhood of Sydney during the month of July of this year, and is intended to be the first of a series of papers on the subject, by means of which it is hoped that the flowering seasons of at least the plants of the county of Cumberland will eventually be recorded.—Notes on the Rutaceæ of the Australian Alps, by James Stirling, F.G.S., F.L.S. Fourteen species of Rutaceous plants are enumerated as occurring in the region of the Australian Alps, of which one belongs to the genus Zieria, two to Boronia, nine to Eriostemon, and two to Correa. Remarks are also made upon the climatic and other conditions under which the plants occur, and the origin of their specific differences.—On a probably new species of tree-kangaroo from North Queensland, by C. W. De Vis, M.A. The name of *Dendrolagus bennettianus* is proposed for a supposed new species of tree-kangaroo of which one specimen was obtained in the Daintree River District. It lived in captivity for a time, but was subsequently killed, and its skin, unfortunately deprived of everything else but the bones of the hands and feet, was subsequently submitted to Mr. De Vis, who, after comparing it with two skins of *D. lumholtzi*, Collett, has no doubt that it is distinct from its compatriot, and is more nearly allied to *D. dorianus*, Ramsay. As full a description as is possible under the circumstances is given in the paper.—Dr. Ramsay exhibited a specimen of an apparently new species of Monacanthus, presented to the Australian Museum by Mr. G. R. Eastway. He also exhibited eggs of *Ptilorhynchus violaceus* and *Rhynchæa australis*, and read notes on the subject.—Mr. A. J. North exhibited eggs of *Menura victoriæ*, Gould, from South Gippsland, and of *Geronticus spinicollis*, Jameson, from Hillston, N.S.W.—Mr. Whitelegge exhibited some magnificent specimens of the Alga *Claudea Bennettiana*, Harvey, hitherto known only from one small specimen. It was found abundantly near the Heads of Port Jackson during a recent trawling excursion in connection with the Australian Museum. Some of the specimens taken were nearly 1 foot in diameter. Mr. Whitelegge also exhibited a fine specimen of *Eozoon canadense*, and slides of it and of the above-mentioned Alga under the microscope.

PARIS

Academy of Sciences, December 20.—M. Jurien de la Gravière, President, in the chair.—Addendum to the note of December 6 on the conditions determining the form and density of the earth's crust, by M. Faye. In reply to M. de Lapparent's further objections to his theory, the author gives more detailed explanations regarding the phenomenon of compensation between land and water, pointing out that to this compensation is due the persistence of the original ellipsoidal figure of the globe.—On the phosphorescence of alumina, by M. Edmond Becquerel. The experiments here described point to different conclusions from those recently arrived at by M. Lecoq de Boisbaudran, while confirming those deduced from the author's earlier researches.—On some dispositions by means of which birefractive photometers may be realised without polarising the light, by M. A. Cornu. Without dispensing with the simpler apparatus of geometrical optics, the author describes several readjustments, which enable him to obtain double images of variable intensity in accordance with a well-known law, without having recourse to the employment of polarised light.—Remarks on M. Hugoniot's notes on the flow of gases, published in the *Comptes rendus* of November 15 and 22, by M. G. A. Hirn. The author replies briefly to the objections urged against his conclusions by M. Hugoniot, and still rejects the kinetic theory of gases, which he persists in regarding as one of the most fatal errors of modern science.—Observations in reference to Dr. Philip Paulitschke's "Researches on the Ethnography and Anthropology of the Somali, Gallas, and Hararis," by M. de Quatrefages. These observations, accompanying presentation of a copy of Dr. Paulitschke's work to the Academy, dwell especially on the great scientific interest presented by the mixed Negroid populations of Eastern Africa to the student of anthropology. These peoples are regarded as the outcome of an extremely ancient crossing between the Negro and the White races, the latter being represented chiefly by the African Semites.—Considerations on deep-sea fishes, and especially on those belonging to the sub-order Abdominalidæ, by M. Léon Vaillant. These remarks have special reference to the captures made by the *Talisman* Expedition, which included no less than 3800 true fishes, and which, combined with the researches of Günther, Gill, Cope, Goode, and Bean, already supply materials for a rough classification of these marine Vertebrates.—On the copper present in the grapes and wines yielded by vines treated with various cupreous preparations against mildew, by MM. U. Gayon and Millardet. These researches seem to show that, while the different processes generally exercise some influence on the quantity of copper contained in the grape and vinous fermentation, they appear to have none at all on the quantity of copper which remains in the wine after fermentation. The clear wine, after perfect clarification, contains no appreciable quantity of the metal.—Volume, absolute heat, and specific heat of saturated vapours, by M. Ch. Antoine. Taking a special zero for each vapour, simple formulas are established for working out these several volumes.—Note on the Abelian functions, by M. Appell.—On angular acceleration, a problem of pure kinematics, by M. Ph. Gilbert.—On the flow of elastic fluids, by M. Hugoniot. The author here applies to the flow of saturated aqueous vapour the same method already employed by him in the study of the flow of permanent gases.—Apparatus showing the two modes of reflection of a vibratory movement, by M. J. Violle. The apparatus here described has been constructed by M. König, and is perfectly adapted for demonstrating the method employed by Regnault in his great work on the measurement of the velocity of sound.—On some new properties, and on the analysis, of the pentafluoride gas of phosphorus, by M. H. Moissan. Having already indicated a new process for preparing this substance, the author here gives some fresh results terminating his researches on the phosphorated compounds of fluor.—On the relations of the efflorescence and deliquescence of the salts with the maximum tension of the saturated solutions, by M. H. Lescœur. The conditions of the efflorescence and deliquescence of the salts as determined by Debray are here brought into rela-

© 1886 Nature Publishing Group

tion with the maximum tension of the saturated solutions.—Heat of formation of the methylate and ethylate of potassa, by M. de Forcrand.—On the wines and brandies extracted from strawberries and raspberries, by M. Alph. Rommier. By the process here described raspberries are made to yield a wine with over 18 per cent. of alcohol instead of the normal 2 or 2·5 per cent., while the brandy distilled from it retains a highly aromatic flavour. A still more palatable wine, with 16 per cent. of alcohol, is obtained from the fine strawberries grown in the neighbourhood of Paris, the corresponding brandy also preserving the flavour of the fruit.—On the zymotic properties of certain virus: fermentations of nitric substances under the influence of non-aërial virus, by M. S. Arloing. The object of this communication is to show that the virus of non-aërial microbes stimulates the fermentation of albuminoid substances.—Note on the multiplication of *Leucophrys patula*, Ehrenberg, by M. E. Maupas. In a favourable medium, a single individual of these Infusoria, which multiply by fissiparity, is found to increase to over a million in five days. Certain hitherto unobserved irregularities in the process of segmentation are here described.—On the phosphorescence of the Geophili, by M. Macé. As studied on a *Geophilus simplex*, Gervais, this phenomenon appears to be analogous to that of certain Chetopteræ described by Panceri and Jourdan.—On the typical nervous system of the dexter and sinister Prosobranchæ, by M. E. L. Bouvier.—Fresh anatomical and physiological studies on the Glyciphagi, by M. P. Mégnin.—The diseases of the olive, by M. L. Savastano. A brief description of the various forms of hyperplasia and tumours by which this plant is affected.—Remarks on the so-called Calcifugal vegetation, by M. Ant. Magnin. A theory is advanced to explain the presence of these plants in the limestone region of the Jura.—On two rocks in the Vélay and Lyons districts, containing beryl and apatite, by M. Ferdinand Gonnard.—On an experiment undertaken to determine the direction of the currents of the North Atlantic, by Prince Albert of Monaco. The author describes a second excursion on board the *Hirondelle*, during which 510 bottles were thrown into the sea along a course about 500 miles long, and nearly parallel with the twentieth meridian west of Paris. The operation was begun on August 29 and completed on September 5, 1886, and some of the floats have already been picked up at various points on the European seaboard; but the general results are reserved for a future communication.—The periodical showers of shooting-stars and the seismic disturbances of the years 1883, 1884, and 1885, by M. Ch. V. Zenger. During these years, both orders of phenomena are shown to coincide, while they are also frequently accompanied by hurricanes, cyclones, electric discharges, and auroras.

BERLIN

Physiological Society, October 29.—Prof. du Bois-Reymond in the chair.—Dr. J. Munk reported on experiments instituted by him in the course of the last two years with a view of arriving at an experimental decision between the two theories of the secretion of urine: the filtration theory of Ludwig, and the secretion theory of Heidenhain. According to the first theory, the blood-pressure prescribed the measure for the urine secretion; according to the second theory, the urine got secreted from the secretory epithelial cells of the kidneys, and the quantity of the matter secreted was dependent on the rate of movement of the circulation of the blood. The speaker had instituted his experiments on excided but living kidneys, through which he conducted defibrinised blood of the same animals, under pressures which he was able to vary at pleasure between 80 mm. and 190 mm. Fifty experiments on dogs whose blood and kidneys were, during the experiment, kept at 40° C., yielded the result that the blood of starving animals induced no secretion of urine, which, on the other hand, showed itself in copious quantities where normal blood was conducted through the kidney. If to the famished blood was added one of the substances contained as ultimate products of digestion in the blood, such, for example, as urea, then did the secretion ensue. The fluid dropping from the ureter contained more urea than did the blood. That fluid was therefore no filtrate, but a secretion. An enhancement of the pressure of the blood flowing through the kidney had no influence on the quantity of the secretion passing away. An increased rate of movement on the part of the blood, on the other hand, increased in equal degree the quantity of urine. On a solution of common salt or of mere serum sanguinis being poured through the kidney, no secretion followed. All these facts, involving the exclusion of the possibility of a central influence being exercised from the heart or from the nervous system on the kidneys, were deemed by the speaker arguments proving that the urine was secreted by the renal epithelial cells. A series of diuretics was next tried, in order to establish whether they operated in the way of stimulus centrally on the heart or peripherally on the renal cells. Digitalis was a central diuretic. Common salt, on the other hand, was a peripheral diuretic. Added in the portion of 2 per cent. to the blood, it increased the quantity of urine eight- to fifteen-fold. Even in much less doses, it was a powerful diuretic. In a similar manner, if yet not so intensely, operated saltpetre and coffeïne, as also urea and pilocarpine. On the introduction, however, of the last substance into the blood, the rate of circulation was accelerated in an equal measure as was the quantity of urine increased, so that in this case the increase in the quantity of urine was, perhaps, exclusively conditioned by the greater speed in the movement of the blood. On the other hand, the quantity of secreted urine was reduced when morphine or strychnine was administered to the blood. In the case of the application of strychnine, the rate in the current of the blood was retarded in a proportion equal to the reduction in the secretion of the urine. The speaker had, finally, demonstrated the synthesis of hippuric acid and sulphate of phenol in the excided kidney as a function of its cells, by adding to the blood pouring through the kidney, in the first place, benzoic acid and glycol; in the second place, phenol and sulphate of soda. In order that these syntheses might make their appearance in the excided kidney, the presence of the blood-corpuscles was not necessary, though, indeed, the presence of oxygen in the blood was indispensable.

BOOKS AND PAMPHLETS RECEIVED

The Origin of Mountain Ranges: T. M. Reade (Taylor and Francis).—The Six Inner Satellites of Saturn; Appendix 1 and 2: A. Hall (Washington).—Conchylien der Gosaumergel von Aigen bei Salzburg: Dr. L. Tausch (Fischer, Wien).—Ueber die Fauna der Oolithe von Cap. S. Vigilio: M. Vacek (Fischer, Wien).—Jahrbuch der k.k. Geologischen Reichsanstalt, 1886 (Hölder, Wien).—Monthly Summaries and Monthly Means for Year 1885, Imperial Meteorological Observatory, Tokio.—Report of the Meteorological Observations for Years 1876-85 at Imperial Meteorological Observatory at Tokio.—The Arithmetic of Electrical Measurements: W. R. P. Hobbs (Murby).—Zoological Record, vol. xii., 1885 (Van Voorst).—My African Home: E. W. Fielden (Low).—Studies in Social Life: G. C. Lorimer (Low).—The Mechanics of Machinery: A. B. W. Kennedy (Macmillan).—A Strain Indicator for Use at Sea: C. E. Stromeyer.—Report on the Progress and Condition of the Government Botanical Gardens at Saharanpur and Mussoorie for Year ending March 31, 1886 (Allahabad).

CONTENTS

© 1886 Nature Publishing Group