

been re-appointed demonstrator to the Jacksonian professor until September 30, 1911.

The Cavendish professor of experimental physics and the Lucasian professor of mathematics have elected Mr. F. Horton, fellow of St. John's College, to be Clerk Maxwell student in succession to Mr. O. W. Richardson, of Trinity College, who has resigned the scholarship.

THE treasurer of Guy's Hospital has received two anonymous donations of 200*l.* and 10*l.* respectively toward the fund for the endowment of medical education and research at Guy's Hospital.

As part of the scheme of university courses in advanced zoology, Dr. W. G. Ridewood will deliver two lectures on "The Structure and Affinities of Cephalodiscus" in the zoological lecture-room of University College, Gower Street, W.C., at 5 p.m. on December 5 and 12. Admission to the lectures is free by ticket obtainable on application to the Academic Registrar, University of London.

It has been suggested to provide a regularly equipped central station for lighting the buildings of the University of Sydney. The work in this station might, it is thought, form part of the college engineering course. In addition to work connected with the generation of power, the scheme would provide opportunity for testing for faults in mains, and for training in the commercial side of station work.

THE Senate of the University of London has received from the Clerk of the Privy Council an intimation that the King in Council has approved the new statutes made for the management of University College and for the constitution and management of the North London or University College Hospital and the School of Advanced Medical Studies connected therewith. All the arrangements made in connection with the incorporation of University College in the University will come into operation on January 1, 1907.

THE University of California has been presented with the herbarium and botanical library of Mr. and Mrs. T. S. Brandegee, of San Diego. The herbarium, *Science* states, is one of the most important in the west of the United States, since it contains something more than 100,000 sheets of carefully selected plants, mostly representative of the Mexican flora, which for many years has been Mr. Brandegee's chosen field, and of the flora of California and neighbouring States, which has received careful treatment at the hands of Mrs. Brandegee. We learn from the same source that the Academy of Natural Sciences of Philadelphia has acquired two important zoological collections. One of these is the Gulick collection of Hawaiian land shells, which served as the basis of Rev. John T. Gulick's well-known work, "Evolution: Racial and Habitudinal," and the other is the Tristram collection of birds, numbering some 7000 skins and representing upwards of 3000 species. This is the second collection made by the late Canon Tristram, the first one having been secured some years ago by the Liverpool Museum.

THOUGH it was more common a few years ago, there is still a disposition in some educational circles to refer to the study of the applied sciences as merely "bread-and-butter studies." In a recent address to the Wolverhampton Technical Schools, published in pamphlet form by Messrs. Longmans, Green and Co., Prof. Ripper has much of value and interest to say as to this contention. He urges, very rightly, that these studies, if properly pursued, must develop scientific methods of thought and give new and higher interests to the student. As Prof. Ripper said, "The same spirit which originally led to the study of technical science will tend also to the desire to travel beyond it. The same qualities which have made the technical expert, will tend also to make the enlightened and cultured citizen." The address concludes with an optimistic estimate of the educational outlook. There is, Prof. Ripper thinks, much more demand than formerly for technically trained assistants. Employers are offering facilities for extended courses of study for their apprentices; for example, several firms in Sheffield arrange for some of their apprentices six months' study at the university and six months' study in the works. Employers, too, are immensely stimulating the work of education by

making their appointments and promotions depend in an increasing degree upon educational fitness.

THE anniversary address of the Royal Scottish Geographical Society was delivered by Sir George Goldie, president of the Royal Geographical Society, on November 22. The subject of the address was "Geographical Ideals." Among a variety of subjects discussed in the address, great prominence was given to the question of the value of geography in war. This value, Sir George Goldie said, might be best brought home to our own countrymen by recalling the enormous expenditure in which the want both of maps and of geographical training of our officers indirectly involved us during the Boer War. He went on to say that he could speak confidently on these points from having served for nearly a year on the Royal Commission on the South African War. He added that the lesson of the war in this respect has not been altogether forgotten. During the last four years a certain amount of money has been expended in Imperial mapping of hitherto unsurveyed regions, and if this process is not altogether arrested by a spirit of false economy, we may possibly at some distant date possess fairly adequate maps of all British possessions. Our ideal must be to reach the level attained by Japanese and German officers. Sir George Goldie finally dwelt upon the importance of educating the people on the subject of geography, and its removal from the subjects of the examinations for the Foreign Office and Diplomatic Service.

THE report of the work of the department of technology of the City and Guilds of London Institute for the session 1905-6 is now available. Statistics are given showing the continuous growth of the work of the department since 1879. The number of subjects in which examinations were held during the session under review was the same as in the preceding year, but the number of separate classes increased from 2601 to 2820, the largest number recorded. There was, too, a marked increase in the number of students in attendance, the number having risen from 41,618 to 44,464. At the examinations at the end of the session 20,610 candidates were presented in subjects of technology, and of these 11,665 passed. Numerous candidates were examined in India and the colonies. We notice that Cape Colony, Jamaica, Malta, Suez, Melbourne, Granville (New South Wales), all presented candidates, but that the largest contingent of colonial candidates was that sent by New Zealand. The system of inspection inaugurated by the institute grows in usefulness. The inspectors appointed by the institute are men and women possessing somewhat different qualifications from those of the inspectors of the Board of Education, and their work is supplementary to that of the Board. Whilst the Board's inspectors report upon the general equipment of technical schools and upon the general character of the teaching, those of the institute are concerned only with the special facilities provided for trade instruction, and report on the methods and the value of the teaching as part of the training of artisans.

SOCIETIES AND ACADEMIES.

LONDON.

Chemical Society, November 15.—Prof. R. Meldola, F.R.S., president, in the chair.—The determination of the rate of chemical change by measurement of gases evolved. Preliminary notice: F. E. E. **Lamplough**. When a chemical reaction takes place in solution resulting in the formation of a gaseous substance, the solvent becomes supersaturated with the gas. The excess of gas so dissolved may be almost entirely expelled by brisk agitation. Under conditions of efficient stirring the rate of evolution of a gas furnishes an accurate and trustworthy method of investigating reactions.—The formation and reactions of imino-compounds, part ii., condensation of benzyl cyanide leading to the formation of 1:3-diaminonaphthalene and its derivatives: E. F. J. **Atkinson** and J. F. **Thorpe**.—Note on the anhydride of phenylsuccinic acid: F. B. **Dehn** and J. F. **Thorpe**. The authors conclude that the anhydride of phenylsuccinic acid exists only in one form, which melts at 53°-54°.—Influence of sodium arsenate on the fermentation of glucose by yeast-juice. Preliminary notice: A. **Harden** and W. J. **Young**. It has been previously shown

that the addition of a soluble phosphate to yeast-juice containing glucose increases the rate of fermentation, which proceeds until an extra amount of carbon dioxide (equivalent, molecule for molecule, to the phosphate added) has been evolved. The phosphate at the same time undergoes a change which renders it non-precipitable by magnesia mixture. When an equivalent amount of arsenate is substituted for the phosphate, a similar acceleration is produced, but the rate is greatly increased, and continues for a time without change until many times the equivalent of carbon dioxide has been evolved, and then falls gradually.—Xanthoxalanil and its analogues: S. **Ruhemann**.—Derivatives of cyanodihydrocarvone and cyanocarvomenthone: A. **Lapworth**.—Reactions involving the addition of hydrogen cyanide to carbon compounds, part vi., the action of potassium cyanide on pulegone: R. W. L. **Clarke** and A. **Lapworth**.—The influence of various substituents on the optical activity of tartramide, part ii., P. F. **Frankland** and D. F. **Twiss**. The authors have prepared and described the *n*- and *isopropylamides*, the *allylamide*, the *n*- and *iso-butylamides*, and the *n-heptylamide* of tartaric acid.—The influence of various substituents on the optical activity of malamide: P. F. **Frankland** and E. **Done**. The authors described the preparation and properties of the *methylamide*, *ethylamide*, and *isopropylamide*, *allylamide*, and *isobutylamide*, *n-heptylamide*, *piperidide*, and *phenylhydrazide* of ordinary l-malic acid.

Royal Meteorological Society, November 21.—The abnormal weather of the past summer and some of its effects: W. **Marriott**. The principal features of the weather over the greater part of England—especially the south-east—were the high state of the barometer throughout the whole of the period, except a portion of August; the high temperature in July, August, and September; the great amount of sunshine; and the deficiency of rainfall. Over the south-eastern portion of England more than 900 hours of bright sunshine were recorded during the four months June to September, while at a few stations in the extreme south and on the east coast more than 1000 hours were recorded. The sunshine was more than 200 hours above the average over the Thames basin and on the coasts of Lancashire and North Wales. The most remarkable feature of the weather during the past summer was the exceptional heat wave which occurred between August 30 and September 3. The temperature rose above 90° over a large part of England on four consecutive days, viz. August 31 to September 3. With the advent of the hot weather the death-rate increased considerably, and it was pointed out that when the mean maximum temperature for the week reached 72° the death-rate at once began to rise. The increase of the death-rate was made up almost entirely of infants under one year of age. This was shown to be due to the prevalence of infantile epidemic diarrhoea, which sets in when the mean maximum temperature for the week rises above 72°.—The International Congress on Polar Exploration held at Brussels in September: Dr. H. R. **Mill**.

Mineralogical Society, November 13.—Prof. H. A. **Miers**, F.R.S., president, in the chair.—Growth of crystals of soluble salts on each other: T. V. **Barker**. This paper is a continuation of the author's previous work on the growths of salts on isostructural minerals to those of soluble isomorphous salts on each other. The group now investigated is that of the chlorides, bromides, iodides, and cyanides of Na, K, Rb, Cs, and Am, which crystallise in the cubic system. The view previously entertained that parallel growths are conditioned by a similarity of molecular volume is again found to hold good; some apparent exceptions are explained by the presence of isodimorphism. One pair of salts, however, NaCl-KI, yield parallel growths, although the molecular volumes are greatly different; this is perhaps to be accounted for by the fact that the molecular volumes are almost exactly in the ratio 1:2.—Notes on some Bolivian minerals: L. J. **Spencer**. Descriptions are given of crystallised jameconite, semseyite from Oruro, new crystal forms on andorite, chalcostibite from Oruro, augelite from Oruro, vivianite from Tatasi and Tasna, tetrahedrite from Huanchaca, regular grouping of stannite and tetrahedrite, valentinite, cassiterite, tourmaline and tour-

maline-hornfels, fluor, apatite, cupriferous miargyrite from Tatasi, crystallised miargyrite from Aullagas, jarosite from Chocaya, chalybite from Chorolque and Tatasi, enargite from Chorolque.—Note on ilmenite from Brazil G. F. Herbert **Smith**. The crystals have three habits, *cam*, *camrX*, *cuXrs*, differing slightly from those described from the same locality by Hussak. The hemihedrism is shown by striations on the prism faces; some magnesium is present.—Description of the Lengenbach Quarry and of the minerals found there in 1906: R. H. **Solly**. The now well-known quarry was opened about the year 1850, and various new minerals were described by Des Cloizeaux and others. From 1860–70 a level was driven in a direction at right angles to the stream, and in it were found the specimens described by Vom Rath. In the decade 1890–1900 a little work was done each summer, resulting in the specimens studied by Baumhauer. Since 1900 Francis Jentsch and his partners have worked the quarry regularly each summer. In 1902 they came across the old tunnel constructed in 1731, the existence of which had been quite forgotten. Up to 1898 eighteen mineral species had been found, of which four are peculiar to the quarry; since that date twenty-five additional species, of which no fewer than twenty are new to science, have come to light. Nine of the new species have been named, two are pseudomorphs, and nine, owing to paucity of material, have not yet been described. The minerals found this year include trechmannite (fine crystals), baumhauerite (curiously striated and distorted crystals), seligmannite (a large crystal 20 mm. in length), jordanite (a twin about 301), dufrenoyite (a twin about 001), pseudomorphs of dolomite and baumhauerite after scapolite (?).—Note on the thirty-two classes of symmetry: H. **Hilton**.—Note on a Canadian mineral: Prof. **Harrington**.—Specimens of turnerite from Cornwall were exhibited by Mr. **Russell**, and crystals of sartorite by Dr. **Trechmann**.

DUBLIN.

Royal Irish Academy, November 12.—Prof. F. A. Tarleton, president, in the chair.—The stability or instability of the steady motions of a perfect liquid and of a viscous liquid; part i., a perfect liquid: Prof. W. McF. **Orr**. It is known experimentally that when water flows through a circular pipe the steady motion is unstable if the velocity exceed a limit depending on the radius of the pipe. Lord Rayleigh has proved mathematically that in this case, as well as in others of flow in plane sheets, including that of a liquid which is shearing uniformly, the fundamental modes of "free disturbance" are stable, when viscosity is ignored in the disturbed motion, the free periods being real. There is thus an apparent contradiction between theory and experiment. It is, however, contrary to the teaching of Fourier analysis to infer that a general disturbance is stable from the fact that the "free disturbances" possess stability, even of an exponential type. In a system disturbed from equilibrium, the question of stability is in reality decided by an energy criterion which is, as a rule, inapplicable to questions of the stability of motion. If a liquid bounded by the infinite planes $y=0$, $y=b$, and shearing uniformly in the direction of x , is subjected to an initial disturbance for which the stream function is $\psi = \sin lx \sin my$, it appears that, if mb and m/l are each large, the disturbance, as shown by equations in which only terms of the first order of small quantities are retained, increases in a great ratio as a certain time approaches, after which it diminishes indefinitely. A similar result is obtained for a symmetrical disturbance of simple type in a circular pipe when the steady motion is that of a viscous liquid. When the steady motion is that of a viscous liquid between concentric cylinders, one or both of which is rotating, a similar result also holds for a two-dimensional disturbance (except the liquid rotates as a rigid body). It is held that these results afford an explanation of the observed instabilities as satisfactory as can be expected from an investigation which ignores viscosity.—A theorem on moving distributions of electricity: Prof. A. W. **Conway**. The integrals which express the electric and magnetic forces for a moving distribution in terms of retarded potentials are discussed, and it is proved that they obey Maxwell's equations outside the electrical matter, but that

inside the equations have to be modified by adding the convection current to the displacement current, as done by Fitzgerald.—The contact-phenomena at the junction of Lias and Dolerite at Portrush: Prof. G. A. J. Cole. The paper describes the microscopic characters of the rocks at and near the junction of Dolerite (or basalt) and calcareous Lias shale at Portrush—a junction of considerable interest in the history of geological opinion. The silicification of the shale is accompanied by the production of abundant minute crystals of a pale green pyroxene. The “bronzite” of Portlock and Oldham, named by them with some hesitation, proves to be a brown mica, locally developed after the formation of the pyroxene. The author has had the advantage of using the original specimens collected by Portlock’s survey. Some details as to the later sheets and veins of dolerite are given, and the occurrence in them of differentiation, by gravitation of ferromagnesian minerals to their under surfaces, is compared with similar cases elsewhere.

PARIS.

Academy of Sciences, November 19.—M. H. Poincaré in the chair.—The inflorescence of the seed-bearing ferns of the Culm and the Coal-measures: M. Grand'Eury.—Observations of the new comet (1906g), made at the Observatory of Besançon with the bent equatorial: P. Chofardet.—Curves reproduced periodically by the transformation (X, Y; x, y, y'): S. Lattès.—A family of hyper-elliptic surfaces of the fourth order: L. Remy.—A theory of magneto-optic phenomena in crystals: Jean Becquerel.—The heat of combustion and formation of some cyclic nitrogen compounds: P. Lemoult. From the experimental data given in this paper the author calculates the thermal changes in passing from nitro-compounds to oxyazo-compounds, from the latter to azo-bodies, from azo- to hydrazo-compounds, and from the last to amines.—The isomorphous crystals of lead nitrate and barium nitrate: P. Gaubert. A mixed crystal of lead and barium nitrates is not homogeneous, in spite of its transparency and limpidity: it is constructed of groups of pyramids the composition of which varies with the nature of the faces to which they correspond. The results are applied to the explanation of a similar structure frequently found in minerals.—The distribution of *Anopheles maculipennis* in the neighbourhood of Lyons: A. Conte and C. Vaney. The reduction in the amount of malaria in this region is much greater than would be expected from the slight reduction in the numbers of mosquitoes that has taken place in recent years. The possible causes of this are discussed.—The consumption of the glucose of the blood by the tissue of the mammary gland: M. Kaufmann and H. Magne. The experiments cited are all in favour of the theory of the transformation of the glucose into lactose in the mammary tissue in secretory activity.—Study of the variations of the mass of the blood in man: Gabriel Arthaud.—Chromotropism and its artificial inversion: Romuald Minkiewicz.—The stroma of the red corpuscles: MM. Piettre and Vila. A new method of separating the stroma is described.—Experimental researches demonstrating that anthracosis of the lungs is due to inhalation, and not to the deglutition of atmospheric dust: —.—The presence of the spirochæta of Schaudinn in the testicle of a new-born syphilitic infant: Ch. Fouquet.—The fractionation of the rare gases in mineral waters: the proportions of helium: Charles Moureu and Robert Biquard.—The hydrology of the Bulgarian Dobroudja: M. De Launay.

DIARY OF SOCIETIES

FRIDAY, NOVEMBER 30.

ROYAL SOCIETY, at 4.—Anniversary Meeting.
 INSTITUTION OF CIVIL ENGINEERS, at 8.—Applications of Electricity in Printing-works: P. A. Spalding.
 INSTITUTION OF MECHANICAL ENGINEERS, at 8.—Steam as a Motive Power for Public Service Vehicles (Discussion): T. Clarkson.
 MONDAY, DECEMBER 3.
 SOCIOLOGICAL SOCIETY (Research Meeting), at 8.—Mating, Marriage and the Status of Women: S. S. Buckman.
 SOCIETY OF CHEMICAL INDUSTRY, at 8.—The Direct Estimation of Antimony: H. W. Rowell.—Bacterial Method of Investigating Disinfectants: M. Wynter Blyth.—The Detannination of Solutions in the Analysis of Tanning Materials: Dr. J. Gordon Parker and H. G. Bennett.
 SOCIETY OF ARTS, at 8.—Artificial Fertilisers: Nitrogenous Fertilisers: A. D. Hall.

TUESDAY, DECEMBER 4.

SOCIETY OF ARTS, at 4.30.—The Cape to Cairo Railway: The Hon. Sir Lewis Michell.
 INSTITUTION OF CIVIL ENGINEERS, at 8.—The Talla Water-supply of the Edinburgh and District Waterworks (Discussion): W. A. P. Tait.—Repairing a Limestone-concrete Aqueduct: M. R. Barnett.—The Yield of Catchment-areas: E. P. Hill.
 ANTHROPOLOGICAL INSTITUTE, at 8.15.—Village Deities in Southern India: Lord Bishop of Madras.

WEDNESDAY, DECEMBER 5.

ENTOMOLOGICAL SOCIETY, at 8.
 SOCIETY OF ARTS, at 8.—The Metric System: Sir Charles M. Watson.
 GEOLOGICAL SOCIETY, at 8.—On the Geological Conditions which have contributed to the Success of the Artesian Boring for Water at Lincoln: Prof. Edward Hull, F.R.S.—Notes on the Raised Beaches of Taital (Northern Chile): O. H. Evans.

THURSDAY, DECEMBER 6.

ROYAL SOCIETY, at 4.30.—*Probable Papers*: A Comparison of Values of the Magnetic Elements deduced from the British Magnetic Survey of 1891 with Recent Observation: W. Ellis, F.R.S.—The Theory of the Composition of Numbers, Part ii.: Major P. A. MacMahon, F.R.S.—On the Transpiration Current in Plants: Prof. Henry H. Dixon.—The Theory of Photographic Processes, Part iii., The Latent Image and its Destruction, an Abstract: S. E. Sheppard and C. E. K. Mees.—The Chemistry of Globulin: W. Sutherland.
 CHEMICAL SOCIETY, at 8.30.—The Liquid Volume of a Dissolved Substance: J. S. Lumsden.—Some Derivatives of Benzophenone; Synthesis of Substances occurring in Coco-bark (preliminary notice): W. H. Perkin, jun., and R. Robinson.—A Synthesis of Terebic, Terpenylic and Homoterpenylic Acids: J. L. Simonsen.
 LINNEAN SOCIETY, at 8.—*Papers*: A Contribution to the Physiology of the Museum Beetle, *Antheus muscorum* (Linn.): Prof. A. Ewart.—Note on the Origin of the Name *Chermes* or *Kermes*: E. R. Burdon.—*Exhibitions*: An Abnormal Specimen of a Dab with Three Eyes: Dr. A. T. Masterman.—A Note on *Siegesbeckia orientalis*, Linn.: Rev. H. Purofoy FitzGerald.
 INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Selection and Testing of Materials for Construction of Electric Machinery: Prof. J. Epstein.

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