instructor in experimental psychology in Harvard University; Dr. Charles Palache, instructor in mineralogy, and Mr. R. J. Forsythe in metallurgy and metallurgical chemistry; Baron Eötvös to be full professor of experimental physics in the University at Buda-Pesth; Dr. O. Hildebrand to be extraordinary professor of surgery in Berlin University, and Dr. Oestreich to be *privat-docent* in general and anatomical pathology; Dr. Klecki to be *privat-docent* in general and experimental pathology at Cracow.

THE new Franco-Scottish Society was inaugurated in Paris last week at the Sorbonne. The objects of the Society are to bring the universities of France and Scotland into connection with each other by study in the one and the other of their respective students, to bring about intercourse between their professors and other officers, to promote historical research concerning the ancient relations between the two countries, in general by periodical meetings held in France and Scotland, and all other means, to renew, as far as possible, the bonds of sympathy between them. About forty delegates attended on behalf of the Scottish universities and interest in higher education; and on the French side, the Paris University and Upper Schools were represented by their chief authorities. Among the subjects discussed was the place of political science in higher education. The congress terminated with a banquet, at which M. Jules Simon presided, given to the Scottish guests by their French colleagues on Saturday.

REFERRING to the late Mr. George Holt, whose death we briefly announced a fortnight ago, the *Lancet* remarks that he took the greatest interest in University College, Liverpool—an interest substantially shown by his first subscription of £10,000 which was requisite to complete its equipment for incorporation in the Victoria University. It was in its medical school that he took a special interest, and his benefactions to it have been numerous. The chairs of Physiology and Pathology were endowed by him in the amount of £10,000 each, to which was added a further sum of £10,000, for the maintenance of laboratories in those branches of investigation. In addition to these benefactions he presented its medical faculty in 1886 with the sum of £2000 for distribution during the ten succeeding years in tutorial scholarships of the value of £100 each. He further fitted up in a complete manner Ashton Hall as a pathological and bacteriological laboratory, which is one of the most complete of its kind in this country. This does not exhaust the list of his benefactions; a further sum of £1000 was given as a donation to the college library, to be expended in annual instalments of £100. He was also a generous contributor to the maintenance fund of the college and a warm friend of education in general. Indeed, it is probably as a benefactor of University College that his name will live longest in local memory.

THE Teacher's Registration Act, which was recently introduced in the House of Commons without comment, is a direct outcome of the work of the late Commission on Secondary Education. Though the Registration Council which it is proposed to establish is not exactly that suggested in the Report of the Commissioners, it will prove quite satisfactory to most of those whose interests are concerned. The Council is to consist of eighteen members—six, appointed by Her Majesty with the advice of her Privy Council; six, elected by the Universities, one by each of the following—Oxford, Cambridge, Durham, London, Victoria, and Wales. Two members chosen by registered teachers engaged otherwise than in elementary schools, two chosen by elementary teachers, and two by registered teachers generally. It is provided by the Act that no person shall be admitted to the register unless he possesses (*a*) "a degree or certificate of general attainments which is granted by some university or other body recognised for that purpose by the Council, and is accepted as satisfactory by the Council; (*b*) a certificate or diploma of adequate knowledge of the theory and practice of education and of practical efficiency in teaching, which is granted by some university or other body recognised for that purpose by the council." Teachers in elementary schools are to be admitted to the register on the same terms as those engaged in secondary schools. It is further to be enacted that if any person (*a*) "wilfully makes or causes to be made any falsification in any matter relating to any register under this Act, or (*b*) by false representation procures himself to be registered under this Act, or not being so registered fraudulently represents himself as being so registered, he shall be guilty of misdemeanour, and shall on summary conviction be liable to be imprisoned with or without hard labour for any term not exceeding twelve months." Teachers of proved attainments and competence who are at present engaged in teaching are to be admitted to the first register.

SCIENTIFIC SERIALS.

THE numbers of the *Journal of Botany* for March and April are again almost entirely occupied by descriptive papers.—Mr. G. Murray describes a new species of *Caulerpa* from South Africa. A number of new fungi are described by Mr. G. Massee, including a new genus *Clypeum*, with no near affinities.

THE second part of vol. vii. of Cohn's *Beiträge zur Biologie der Pflanzen* contains three papers.—Dr. O. Kirchner describes the root-tubercles of the Soja-bean, which, like those of other plants belonging to the pea-tribe, are caused by a microbe; large quantities are found imbedded in the tissue of the tubercle, and he regards them as belonging to a new species, which he names *Rhizobacterium japonicum*, found in the soil of Japan. As in other cases, the relation of the microbe to the host is a symbiotic one, enabling it to absorb into its tissues the free nitrogen of the atmosphere.—T. Rosen contributes a chapter to his *Beiträge zur Kenntniss der Pflanzen-zellen*, in an account of the nuclei and nucleoles in meristematic and sporogenous tissues. It is a very important contribution to our knowledge of the intricate phenomena connected with cell-division, and of the part played by the nucleus and its nucleoles in the process.—Dr. E. Heinricher describes the structure and function of the haustoria of the parasitic genus *Lathræa* or toothwort, especially of the two species *L. squamaria* and *L. clandestina*. From various points of structure he concludes that *Lathræa* is more nearly allied to the typical *Scrophulariaceæ* through *Rhinanthus*, than it is to the *Orobancheæ*, under which it is usually placed.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, March 10.—"Helium: a Gaseous Constituent of certain Minerals. Part II. Density." By William Ramsay, F.R.S.

The gas obtained from the minerals bröggerite, samarskite, and fergusonite is rich in hydrogen, but contains only an infinitesimal quantity of nitrogen; carbon dioxide and helium are also evolved, but no gas of new spectrum, even in samples not passed through the usual absorbents, soda-lime and phosphoric anhydride. From 1 gram of clèveite, 7·2 c.c. of helium is obtainable; 1 gram of bröggerite yields less than 1 c.c.; 1 gram of samarskite, about 0·6 c.c.; and 1 gram of fergusonite 1·1 c.c.

The density of the samples of gas from these various minerals appears to show small, but real differences. That from clèveite was found to be 2·205 (oxygen = 16), but Langlet found a sample from the same source to possess the density 2. The helium from bröggerite has the density 2·18; that from samarskite 2·12, and that from fergusonite 2·14. These differences are small; but as they are the means of several determinations with different preparations, and as the individual determinations differ less among themselves than the densities of specimens from different minerals, there appears ground for the supposition that helium is a mixture. The possibility of this conclusion is strengthened by the fact that the relative intensity of the lines in the spectrum of the gas from clèveite is different from that of the samples from bröggerite, samarskite, and fergusonite; and this difference, indeed, is visible without the aid of a spectroscope, for the clèveite gas has a richer shade of yellow, tending towards orange, than that from the other minerals; the colour of such samples is a purer yellow. Moreover, there are certain faint lines in the blue-green in the spectrum of the clèveite gas, which have not been observed, even under the most favourable circumstances, with "end-on" tubes, in that of the gas from other sources.

The author is engaged in an attempt to separate the possible constituents of helium.

"Angular Measurement of Optic Axial Emergences." By William J. Pope.

The ordinary methods of determining the angle, α, between the direction of emergence of an optic axis into air and the normal to the crystal plate, being very inaccurate unless the plate has a highly polished surface, the author has devised a new method by which this angle, α, can be determined to within 2 or 3 minutes of arc. The crystal is mounted in the Fuess axial angle apparatus, and a reading taken for the air emergence of the optic axis; a cell containing oil of known refractive index, μ, is then brought up round the crystal plate, and a new reading taken for the oil emergence of the optic axis. From the difference of the two angular readings, $\alpha - \theta$, the angle α may be calculated from either of the formulæ

$$\cot \alpha = \cot (\alpha - \theta) - 1/\mu \sin (\alpha - \theta)$$

or

$$\tan (\alpha + \theta)/2 = \mu + 1/\mu - 1 \tan (\alpha - \theta)/2.$$

Series of test measurements are given, proving the efficacy of the method; when α is 53° 24′, and μ is 1·6473, the measured value of $\alpha - \theta$ is 24° 15′, a fairly large angle. Oil of the highest attainable index of refraction should be used in order to obtain maximum values of $\alpha - \theta$; the refractive indices are conveniently determined by aid of the Pulfrich total-refractometer.

March 26.—"Additional Report on Erect Trees containing Animal Remains in the Coal Formation of Nova Scotia." By Sir J. William Dawson, F.R.S.

Linnean Society, April 2.—Mr. J. G. Baker, F.R.S., Vice-President in the chair.—On behalf of Dr. F. Arnold, of Munich, the Secretary exhibited several photographs of typical lichens, received in continuation of a series which has been for some time past in course of issue by that well-known lichenologist.—Mr. M. F. Woodward exhibited a very young example of the "Spiny Ant-eater," *Echidna aculeata*, taken from the mammary pouch of the parent at Newcastle, Western Australia, by Mr. H. B. Woodward, Curator of the Perth Museum. It was intermediate in size between two stages described by Prof. Parker, but showed no trace of the calcaneal spur characteristic of the male, nor any trace of the mammary pouch peculiar to the female. He called attention to the flattened and beak-like character of the snout and the vestiges of the "egg-breaker," and to the disposition of the spine papillæ. For the purpose of comparison, Mr. Woodward exhibited also the heads of *Ornithorhynchus* and *Echidna*, and a male and female mammary fœtus of *Perameles*.—A paper was read by Mr. C. H. Wright, "On the Genus *Stemona*, Lour.," one of the few monocotyledonous genera whose flowers are constructed on a tetramerous type, and remarkable for the diversity of its vegetative characters, while its floral structure varies between comparatively narrow limits.—Lieut.-Colonel C. T. Bingham, in a paper on some exotic fossorial Hymenoptera in the British Museum (communicated on his behalf by Mr. W. F. Kirby), enumerated thirty-four species, of which no less than thirty were previously undescribed. The discovery of many of these was due to the researches of the author, who had spent twelve years collecting in Sikkim, Burma, and Tenasserim.—The President then gave a descriptive account of the Khasia Hills from personal experience, dwelling on their geological formation, the extraordinary rainfall of the district (120 inches in five days), and the chief characteristic features of the flora and fauna.

Royal Meteorological Society, April 15.—Mr. E. Mawley, President, in the chair.—Mr. W. Ellis, F.R.S., read a paper on the mean amount of cloud on each day of the year at the Royal Observatory, Greenwich, on the average of the fifty years 1841-90, in which he showed that a principal maximum occurs in winter and a principal minimum in autumn, with a secondary much less pronounced maximum in summer and a secondary minimum in spring. There is, however, considerable irregularity in the succession of daily values, the differences between which on consecutive days are in numerous cases relatively large. Cloudless days are most numerous in spring and autumn, and least so in winter and summer; days of little cloud are somewhat less numerous in winter as compared with other parts of the year, whilst days of medium cloud are much more numerous in summer than in winter. Days of much cloud are nearly equal in amount in all parts of the year; whilst overcast days are much more numerous and nearly equal in amount in the first and fourth quarters of the year, much less numerous in the second quarter, and again less numerous in the third quarter.—Mr. E. D. Fridlander gave an account of some observations of the amount of dust in the atmosphere made at various places during a voyage round the world in 1894-95. The experiments, which were made with a form of Aitken's pocket dust counter, showed that there are often considerable variations in the number of dust particles in a very short space of time. Not only did dust occur in the air of inhabited countries, over the water surfaces immediately adjoining them, and up to an altitude of 6000 or 7000 feet amongst the Alps, but it was also found in the open ocean, and that so far away from any land as to preclude the possibility of artificial pollution, and its existence has been directly demonstrated at a height of more than 13,000 feet.—Major H. E. Rawson gave an analysis of the Greenwich rainfall records from 1879 to 1890, with special reference to the declination of the sun and moon.

EDINBURGH.

Royal Society, April 6.—Rev. Prof. Flint in the chair.—A communication by Drs. Stewart and Young, of the Public Health Laboratory, Edinburgh University, on the bacteria in milk as supplied in Edinburgh, and the relative efficiency of different methods for their removal, was read by the former. Since 1894, samples of milk from dairies all over the town had been examined, and it was found that bacteria were most numerous between July and October. The milk from dairies with cowhouses in town contained, five hours after milking, more than eight times the number of micro-organisms in milk from dairies supplied from the country. Methods for sterilising were described, but each imparted a boiled taste to the milk. Scalding, at 176° F., would keep the milk sterile for twenty-four hours if great care were taken, but when performed on a large scale there could be no guarantee, owing to possible post-scalding contamination, that the bacillus of tubercle and diphtheria were not present.—Dr. J. Macintyre, Glasgow, indicated some new results which he had got with the Röntgen X-rays. He described his methods for reducing exposure and obtaining definition, and exhibited photographs of different parts of the skeleton of the living subject. Among these were that of one side of the head, obtained by putting the tube so near the other side that its image was eliminated, the sternum and ribs, and the vertebral column with scapula and clavicle. Dr. Macintyre described screens of different kinds which he had made, of which the one saturated with barium platinocyanide was the best. He suggested the use in surgery of fluorescent screens for the cavities, such as the mouth, throat, and maxillary antrum, and exhibited the result of an attempt at photographing tissue. In the kidney, from a cadaver shown, the distinctive in structure of the different parts, and the presence of a calculus, were quite apparent.—Dr. W. G. Aitchison Robertson read a summary of an investigation regarding the digestion of starch in the stomach. He showed under what conditions, normal and abnormal, amylolysis ceases in the stomach, and the effect which the gastric secretion has on the ferment ptyalin.—A communication from Lord Kelvin on impulsive fluid motion was held as read.

PARIS.

Academy of Sciences, April 15.—M. A. Cornu in the chair.—On fallow ground, by M. P. P. Dehérain. The ancient practice of allowing land to lie a year fallow after three years cultivation is shown to have rested upon a sound basis, the land increasing considerably in nitric nitrogen during the fallow year. With modern manures the necessity for this no longer exists, although the practice still survives in many parts of Europe.—Nitrates in spring water, by M. T. Schlœsing.—On a letter from Gauss, of date June 16, 1805, by M. de Jonquières. The letter was written to M. Delisle, Professor of Mathematics at Orleans.—On the products of combustion of an acetylene burner. Explosive mixtures of acetylene and air, by M. N. Gréhant. The combustion of acetylene in an ordinary fish-tail burner is complete, the products not comprising the least trace of a combustible gas containing carbon. With mixtures of acetylene and air the most violent explosion was produced when the volume of air was nine times that of the acetylene.—On certain classes of Laplacian equations with equal invariants, by M. A. Thybaut.—Verification of Kerr's law in absolute measure, by M. Jules Lemoine. By the use of a condenser having carbon disulphide as the dielectric, with potentials varying from 5000

35,000 volts, Kerr's law was found to be correct to within least 1 per cent. The absolute value of the constant for bon bisulphide is $3{\cdot}7 \times 10^{-7}$.—On electrified Röntgen s, by M. A. Lafay. A verification of results previously blished. It was found that it was a matter of indifference, deviating the Röntgen rays, whether they were electrified ore or after traversing the magnetic field.—The action of the ntgen rays upon double and triple electric layers, by M. N. tschikoff. The rays discharge the double electric layer very wly, if at all.—On the mechanical action emanating from okes' tubes, by MM. A. Fontana and A. Umani. A claim priority.—Application of photography by the Röntgen 's to analytical researches on vegetable materials, by M. F. nwez. The adulteration of vegetable products with mineral stances, such as saffron with barium sulphate, is readily de- ted by the differences in the shadows cast by the X-rays.— homolinalool and on the constitution of licareol and arhodol, by MM. Ph. Barbier and L. Bouveault.—Action of sodio-cyanacetates of propyl, butyl, and amyl upon diazo- nzene chloride, by M. G. Favrel. The hydrazones obtained ist in two isomeric modifications, distinguishable by their elting points.—On the diurnal lunar wave and on the secular riation of the barometer, by M. P. Garrigou-Lagrange. The tion of the moon on the atmosphere is well marked. On the nth parallel of latitude, the waves caused by the moon may nount to 1·2 mm. of mercury.—On the principal results of the st ascent to a great height of the balloon *Aerophile* (March 22 895), by MM. G. Hermite and G. Besançon. At a height of ght and a half miles the minimum temperature recorded was 63° C., or a fall of 1° per ·597 feet.—Animal temperatures in ie problems of evolution, by M. Quinton. The temperatures evailing on the globe in the remote past were higher than at resent, owing to the gradual cooling of the globe. An animal those life process was in equilibrium with a given temperature then the temperature commences to fall, must do one of two things -either adapt its chemical and physiological changes to the sur- ounding temperature, as in the case of the pepsin of a reptile, hich will act on a food at temperatures near 0°, or may tend to rtificially maintain the temperature of the body, by developing eat. Thus in one group of animals, whose evolution had eased before appreciable cooling had set in, the greater the ntiquity the smaller ought to be their power of developing eat. With animals, on the contrary, whose evolution had been prolonged into the cold ages, the reverse would be the ase, the body temperature being the lower, the older the nimals. Experimental figures confirm these theoretical reduc- tions.

BERLIN.

Physical Society, March 13.—Prof. von Bezold, President, n the chair.—Dr. Lindau, of Munich, spoke on the cooling of gases during their adiabatic expansion, and showed that from this the specific heat of the gases may be determined. In oppo- sition to this view Prof. Planck pointed out that the cooling does not depend solely on specific heat, but also on the extent to which the gas differs from the condition of a perfect gas.—Dr. Orlich demonstrated how every phasic variation of alternating currents may be shown by means of two of Rubens' vibration- galvanometers placed at right-angles to each other. He intends to carry out further experiments in order to see whether the variations are measurable by this method.—Prof. A. König made a communication on the absorption spectra of visual purple from various vertebrates, and on visual yellow, which he had only once been able to investigate as obtained from the visual purple of a human retina, whereas the visual purple of other vertebrates never yielded visual yellow. He hoped to be able to control this single observation, should the chance of so doing present itself.

March 27.—Prof Warburg, President, in the chair.—Mr. Archenholz reported on his experiments with a view to testing the statements of Le Bon as to black light. He showed how great is the difficulty of completely excluding all lateral light even by using metallic screens, and exhibited photographs in support of this, and came finally to the conclusion that Le Bon's black light is merely a false light. Experiments made with Balmain's material on the permeability of wood and metal by phosphorescent rays were similarly negative.—Prof. Goldstein spoke on the means for increasing the intensity of Röntgen X-rays, of which he mentioned two. The first consists in using the rays the substances. The second consists in the employment of potas- sium platinocyanide, which emits a blue light acting very rapidly on photographic plates. Further, a plate had recently been pre- pared by Siemens and Halske, which gives a clear image of the hand in a few seconds by Röntgen's rays, and finally Kahlbaum has prepared a barium platinocyanide which similarly materially shortens the necessary exposure.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

BOOKS.—The Treatment of Phthisis: Dr. A. Ransome (Smith, Elder).—Handbook for the Bio-chemical Laboratory: Prof. J. A. Mandel (Chapman).—A Compendium of General Botany: Dr. M. Westermaier (Chapman).—Modern Stone-Cutting and Masonry: J. S. Siebert and F. C. Biggin (Chapman).—Meteorological Observations made at the Adelaide Observatory, &c., 1891, 1892, 1893 (Adelaide).—The Water Supply of the City of New York, 1658-1895: E. Wegmann (Chapman).—The U.S. Public Works: Captain W. M. Black (Chapman).—Cholera in Indian Cantonments, and how to deal with it: E. H. Hankin (Cambridge, Deighton).—James Clerk Maxwell and Modern Physics: R. T. Glazebrook (Cassell).—An Elementary Treatise on the Calculus for Engineering Students: J. Graham (Spon).—Les Tramways: R. Seguela (Paris, Gauthier-Villars).—Astronomie, Astrophysique, Géodésie, Topographie et Photogrammétrie: G. Towne, 2 Vols. (Paris, Bertaux).

PAMPHLETS.—Medical Inspection of, and Physical Education in, Schools: C. Roberts (Bale).—Weitere Ausführungen über den Bau der Cyanophyceen und Bacterien: Prof. O. Bütschli (Leipzig, Engelmann).—Stonyhurst College Observatory. Results of Meteorological and Magnetical Observations, 1895: Rev. W. Sidgreaves (Clitheroe).—Colonial Origins of New England Senates: F. L. Riley (Baltimore).—Licht-, Elektricitäts- and X-Strahlen: R. Mewes (Berlin, Krayn).—Die Fortpflanzungs-Geschwindigkeit der Schwerkraftstrahlen: R. Mewes (Berlin, Krayn).

SERIALS.—Proceedings of the Physical Society of London, Vol. xiv. Part 4 (Taylor).—Journal of Anatomy and Physiology, April (Griffin).—Royal Natural History, Part 30 (Warne).—Journal of the Chemical Society, April (Gurney).—Journal of the Institution of Electrical Engineers, April (Spon).—Microscopical Studies in Botany, March (Jersey, Hornell).—Mind, April (Williams).—Contributions from the U.S. National Herbarium, Vol. iii. No. 7 (Washington).—American Journal of Mathematics, Vol. xviii. No. 2 (Baltimore).—Internationales Archiv für Ethnographie, Band ix. Heft 2 (Leiden, Brill).

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