and what steps the Government proposes to take in the matter, in view of the unsatisfactory accommodation for the University disclosed in the report of the Royal Commission on University Education in London? In reply, Mr. Asquith said the Government has provided accommodation for the London University throughout its history. The minute cited was written before the removal of the old University to South Kensington, and refers to the possibility of an arrangement between the authorities of the Imperial Institute and the Treasury. It must not be construed as admitting liability on the part of the Government to provide for all possible requirements of the University in the future. The report of the Royal Commission points out that the University must depend to a large extent upon private endowments for its full development. The Government does not think that it would be opportune to take any steps in connection with the matter before the final report of the Commission is published.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, February 29.—Sir Archibald Geikie, K.C.B., president, in the chair.—Dr. A. **Harden** and Dorothy **Norris**. The bacterial production of acetylmethylcarbinol and 2 : 3-butylene glycol.—II. Péré considered that glyceraldehyde was produced during the bacterial fermentation of sugars, and advanced the hypothesis that all sugars undergoing such decomposition were primarily broken down to glycerose. The authors have repeated his experiments, and find that the volatile, reducing, and lævorotatory substance which he considered to be glyceraldehyde is in reality acetylmethylcarbinol. Hence the above hypothesis cannot be considered as proved. A quantitative examination has been made of the products formed by the action of *B. lactis aërogenes* (Escherich) on glycerol under anaërobic conditions. These consist of ethyl alcohol and formic acid, comprising 60 per cent. of the whole, together with smaller quantities of acetic, lactic and succinic acids and 2 : 3-butylene glycol, carbon dioxide, and hydrogen.—H. S. **Ryland** and B. T. **Lang**: An instrument for measuring the distance between the centres of rotation of the two eyes. The apparent position of a pin fixed at a known distance in front of a scale is taken with each eye singly. The operation is repeated with the pin at a different distance, the other conditions remaining unaltered. From the data thus obtained the distance between the centres of rotation of the two eyes can be calculated. The result is independent of variations in the distance between the pupils, and the process can be applied in cases of squint. In an alternative method three pins in a row parallel to the scale are used.—J. F. **Gemmill**: The locomotor function of the lantern in Echinus, with remarks on other allied lantern activities. (1) *Locomotion out of water* (reference is made to previous accounts by Romanes and Ewart).—The urchin raises itself from time to time on the tips of its teeth in preparation for a forward "step" or lurch. The "step" is then brought about (*a*) by strong pushing or poling on the part of the lantern, (*b*) by similar but weaker action on the part of the spines, (*c*) by the influence of gravity acting at a certain stage. Active progression by lantern alone is possible in small and medium-sized urchins. Progression by spines alone is very limited indeed. An urchin can travel with the help of its lantern even when loaded to the extent of half a pound or more. There is usually some rotation as well as progression, but the two are not associated as cause and effect. The causes of rotation are discussed, and an analysis is given of the lines or curves of progression in relation to rotation. Other points to which attention is directed are:—muscles involved; strength of effort; change of direction; inversion; equatorial section; recording surfaces of plasticene and other substances; the inertia and momentum of the rhythmic action. (2) *Locomotion under water*.—Here the lantern is not needed for ordinary locomotion, particularly over more or less horizontal surfaces. There are, however, various circumstances, normal and experimental, in which it is employed with effect—for example, when the urchins are loaded or travelling up a slope on certain surfaces, or only partially immersed, or mounting rapidly up a vertical surface. (3) The locomotor action of the lantern is a particular manifestation of a rhythmic functional activity which can also subserve feeding (no doubt the most important function), boring, and "forced respiration."—Captain A. D. **Fraser** and Dr. H. L. **Duke**: The relation of wild animals to trypanosomiasis. (1) *Trypanosoma uniforme* was the only species of trypanosome obtained as the result of examination of wild animals, including thirty-two Lake-shore antelopes. (2) The available evidence points to bush-pig, crocodile, monitor, frog, and fowls being refractory to *T. gambiense*. (3) The edible rat, which is susceptible to *T. gambiense*, can, by virtue of its habits, be of little importance in considering the question of a reservoir.—Dr. H. L. **Duke**: The transmission of *Trypanosoma nanum* (Laveran). This trypanosome can be transmitted by *Glossina palpalis*, the proportion of positive flies obtained being relatively large, and indicating that this fly may play an important part in the spread of the disease in Uganda.—E. H. **Ross**: The development of a leucocytozoon of guinea-pigs. The paper describes an investigation of some remarkable structures found in the mononuclear leucocytes (lymphocytes) of the blood of guinea-pigs; they are known as "Kurloff's bodies." There has been considerable controversy regarding the nature of these bodies, some authorities describing them as vacuoles containing secretion products, some as symbiotic structures, as chlamydozoa, as cytoryctes, as parasites, and as spurious parasites. By a new technique for *in vitro* staining, known as the jelly method, the minute structure of these bodies can be seen, while the lymphocytes which contain them are stained alive. The method shows conclusively that Kurloff's bodies are living parasites. The method also shows how the bodies develop within the lymphocyte host, for the chromatin within them stains in the various phases, and the whole development can be followed from the earliest Leishmania-like inclusion in the leucocytes until ultimately the leucocytozoon is seen to contain a mass of spirochæte-like bodies which have been likened to *gametes*. The blood of such guinea-pigs shows, when examined with the dark-ground illumination, free-swimming spirochætes, and these have been fixed and stained. The details of the jelly method are described.

March 7.—Sir Archibald Geikie, K.C.B., president, in the chair.—Sir William **Crookes**: The devitrification of silica glass. A clear and transparent tube of silica glass with a bulb blown at one end was exhausted to a high vacuum. It was heated in an electric resistance furnace in such a manner that the bulb was exposed to the greatest heat while the lower part of the tube was comparatively cool. After being kept at a temperature of 1300° C. for twenty hours the bulb and upper part of the tube had devitrified, becoming white and translucent like frosted glass. The tube was resealed, exhausted, and exposed to 1300° for eleven hours. On cooling, the point of the tube was broken under mercury, and from the

amount that entered it was ascertained that 7·79 per cent. of the tube's capacity had leaked through the devitrified silica.—Sir William **Crookes**: The volatility of metals of the platinum group.—Prof. W. M. **Hicks**: A critical study of spectral series. Part ii.—The principal and sharp sequences and the atomic volume term. This is a sequel to a paper on the same subject published in the Philosophical Transactions, vol. ccx. (1910). The sequences which give the principal and the sharp series are discussed as they occur in the second and third groups of the periodic table of the elements, and it is found that, in opposition to the rule in the alkalies, the P-series is based on the *s*-sequence and the S-series on the *p*-sequence. Additional evidence is afforded to show that these sequences depend on atomic volumes of elements in quite definite way.—Prof. W. E. **Dalby**: An optical load-extension indicator, together with some diagrams obtained therewith. The paper describes a new instrument by means of which automatic records of load-extension diagrams can be obtained with precision, the records being free from errors due to inertia, pencil-friction, and to any strains caused by the yielding of the testing machine in which the specimen is being tested.—R. **Whiddington**: The transmission of kathode rays through matter. It has been found experimentally that a kathode ray moving with velocity v_0 can possess, after traversing a thickness x of material, a velocity v_x given by the relation $v_0^4 - v_x^4 = ax$, where a is a constant depending on the nature of the material.—R. **Whiddington**: The velocity of the secondary kathode particles ejected by the characteristic Röntgen rays. Application of the results of the preceding paper to the experimental investigations of Beatty into the absorption of kathode particles in air leads to the conclusion that the fastest of the secondary kathode particles ejected from a plate by Röntgen rays characteristic of the element of atomic weight w possess a speed equal to $k'w$, where k' is a constant nearly equal to 10^8.—E. E. Fournier **d'Albe**: The potential effect in selenium. A new type of selenium bridge (or "selenium cell") was constructed by coating a plate of unglazed porcelain of high insulating power with graphite and dividing the surface into two conducting portions by cutting, with a diamond, a to-and-fro line through the graphite. The plate was then coated with selenium and sensitised. The bridges so constructed showed no polarisation, and were well adapted to the study of the "potential effect," or the change of resistance with the voltage applied.

Institution of Mining and Metallurgy, February 15.—Mr. H. Livingstone Sulman, president, in the chair.—C. O. **Bannister**: On the theory of blast-roasting of galena. This is an exhaustive record of researches made by the author, with the view of determining the nature of the reactions that take place during the blast-roasting of galena when present alone and when in admixture with lime, limestone, gypsum, etc. The introduction of the paper deals with the previous researches of Huntington and Heberlein, Carmichael and Bradford, Savelsburg, Austin, Dwight and Lloyd, and others, and the theories to which the published results of those authorities gave rise, and the author then goes on to describe his own recent series of experiments, with diagrams and tables showing the observed conditions in temperature at different periods of time during the course of roasting galena mixed with lime, silica, litharge and lime, limestone, calcium sulphate, magnesium oxide, ferric oxide, slaked lime, etc. As a result of his carefully conducted experiments the author has arrived at the conclusion that the older theories as to the formation and subsequent reaction of peroxides, plumbites, and plumbates are wrong, as also those depending on definite reactions between calcium sulphate and lead sulphide; that later theories depending on the diluent effect of various agents are only partially true; that the oxidation of lead sulphide takes place in three stages; that in the presence of lime, limestone, and magnesia, the sulphates of calcium or magnesium are formed in preference to sulphate of lead; that silica and calcium act merely as diluents, without chemical action until a temperature of over 1000° is reached; that ferric oxide in certain physical states acts as a catalysing agent; and that silica acts at high temperature in decomposing lead sulphate and calcium sulphate.—H. K. **Picard**: A graphic method of illustrating the results of extraction tests. The author has devised for his own use a system of placing in graphic form the results of extraction or concentration tests on ore samples, which is illustrated and described. It consists in the employment of "squared" paper, on which areas are marked out for the various weight units of the tests carried out, and the percentages of ore content are indicated by covering so many squares of these areas with a wash of solid colour. The result, as shown in an example submitted by the author, is at once apparent, and from the graphic indications it can be ascertained whether certain products should be rejected, re-treated, or mixed with other products.—A. T. **French**: Quick combination methods in smelter assays. This paper, which is practically a collection of laboratory notes presenting together a scheme for the combination of various approved methods of smelter analysis, was not discussed at the meeting owing to the lateness of the hour.

Geological Society, February 28.—Dr. Aubrey Strahan, F.R.S., president, in the chair.—L. J. **Wills**: Late Glacial and post-Glacial changes in the Lower Dee Valley.—E. B. **Bailey** and M. **Macgregor**: The Glen Orchy anticline (Argyllshire). The district described stretches from the head of Loch Awe to Beinn Achallader, and is the south-eastern continuation of the Fort William, Ballachulish, and Appin country dealt with by one of the authors two years ago. The subject is the tectonics of the schists.

CAMBRIDGE.

Philosophical Society, February 26.—Dr. A. E. Shipley, F.R.S., in the chair.—L. **Doncaster**: The chromosomes in oogenesis and spermatogenesis of *Pieris brassicae*.—R. P. **Gregory**: The chromosomes of a giant form of *Primula sinensis*.—Dr. **Cobbett**: Preliminary note on the occurrence of living bacteria in the organs and blood of normal animals.—S. R. **Price**: Some observations with dark-ground illumination on plant cells.—R. C. **McLean**: Rhizopods from the Carboniferous period.

EDINBURGH.

Royal Society, February 5.—Sir T. R. Fraser, F.R.S., vice-president, in the chair.—Dr. R. Stewart **MacDougall**: The bionomics of *Nematus ericksoni* (Hartig), the large larch-sawfly. The larvæ of this sawfly, which was first noticed in numbers some years ago in the Lake district, have also been found at work in Wales, and more recently in Perthshire and Forfarshire. In breeding out adults from cocoons collected in spring, Dr. MacDougall obtained 165 females to one male. Hewitt had previously recorded two males to 298 females. To test this suggested parthenogenesis, seven newly issued virgin females were placed on May 26, 1910, on a young larch, which was potted and so confined that no other insect had access to it. By June 12 three were dead, and in a few days the remaining four had died. Although there was no reasonable doubt as to the sex, the dead

insects were dissected, and proved all to be females. Eggs had been freely laid, and through June the caterpillars which hatched from them fed greedily. Examination on July 3 showed two caterpillars on the soil of the pot, and these had spun their cocoons by July 7. On July 17, the soil was sifted from the pot, and altogether 47 cocoons and five dead caterpillars were found. The cocoons were kept over the winter in suitable conditions indoors. On April 21 three females issued, and by May 8 fourteen other adults—all female. In five other similar experiments with virgin females, eggs were freely laid and caterpillars hatched. One experiment gave no result. Dissection of the female adults showed ovaries with eighteen tubes to each, and at the moment of dissection 180 eggs. From cocoons collected in the open many parasites were also bred, *Mesoleius aulicus* being abundant. Dissection of *M. aulicus* females showed twenty tubes to each ovary, and at the moment of dissection 160 eggs. Out of 249 cocoons 171 of *Nematus ericksoni* issued, 62 Ichneumonid parasites, and 16 Tachinids of the species *Exorista*.—Prof. W. **Peddie**: The molecular theory of magnetism in solids. The theory was developed so as to apply to a single homogeneous arrangement of molecular magnets in any crystalline grouping. The results in the special cases of cubic and hexagonal arrangements were applied to the magnetic crystals magnetite and pyrrhotine. A possible application to the case of the earth's magnetism was also discussed.—G. P. **Seamon**: Note on torsional oscillations of magnesium wire. These experiments were a continuation of Peddie's own experiments on torsional oscillations, and gave similar results to those obtained with other kinds of metals.

PARIS.

Academy of Sciences, February 26.—M. Lippmann in the chair.—Maurice **Hamy**: The determination of the astronomical flexion of meridian circles.—A. **Hallrer**: The preparation of 1 : 5-diphenyl-2 : 2 :4 : 4-tetramethyl-3-pentanone and 1-phenyl-2 : 2 : 4 : 4-tetramethyl-3-pentanone. The method of alkylating with sodium amide and methyl iodide has been applied to symmetrical dibenzylacetone and 1-phenyl-3-pentanone. The successive methylation of these two ketones has given the desired tetramethyl derivatives as the final products.—A. **Laveran**: Generalised infection of mice by *Leishmania donovani*. It has been shown experimentally that generalised infections can be caused in mice by *L. donovani*, and it is probably the same for the rat. It still remains to be proved if the small rodents can contribute to the propagation of the disease.—Paul **Sabatier** and A. **Mailhe**: A new method of catalytic preparation of the aldehydes, starting from the acids.—Pierre Puiseux was elected a member of the section of astronomy in the place of the late M. Radau.—Milan **Stefanik**: Observation of the total eclipse of the sun (April 28, 1911) at the island of Vavau.—Ch. **Maurain** and A. **Toussaint**: Study of the surfaces of aëroplanes with an electric carriage. The only accurate measurements made up to the present on the action of air on aëroplane surfaces have been carried out on small-scale models exposed to currents of air. The present experiments were carried out on full-sized planes, carried on an electrically driven carriage with a range of velocities up to 23 metres per second. A set of experimental results for two surfaces of different shapes is given.—M. **Guéritot**: An attempt at a method permitting the deduction of the ratio of the two specific heats of gases from a volume measurement.—G. **Charpy** and S. **Bonnerot**: The permeability of iron for hydrogen. That iron is permeable to hydrogen has been known since the researches of Saint Claire Deville and Troost, but no quantitative measurements have been made. The authors have measured the rate of passage of hydrogen through iron at temperatures ranging between 350° C. and 850° C.—P. **Langevin**: The comparison of gaseous and dissolved molecules. A reply to the criticism of M. Colson on the laws of dissociation of nitrogen peroxide in the gaseous state and in chloroform solution. It is shown that in concentrations sufficiently dilute, that is, in concentrations directly comparable with those in the gaseous conditions, the dissociation constant of nitrogen peroxide in chloroform solution is in good agreement with the law of mass action, allowance being made for the known difficulty in the colorimetric measurements.—Georges **Dupont**: The oxyhydrofuranes. The ketohydrofuranes give the oxyhydrofuranes by reduction with sodium and alcohol, although the reaction fails in some cases. The reduction could not be effected with zinc and potash or ammonia, with sodium amalgam or with hydrogen and platinum black.—C. **Picado**: The nutrition of the epiphytic Bromeliaceæ. These plants absorb not only mineral salts, but also proteid substances arising from the digestion of the vegetable and animal detritus retained in their leaves. They are the only plants which feed regularly on such detritus.—E. **Pinoy**: The preservation of wood. The wood is covered with a solution containing 5 per cent. of gelatin, 2 per cent. of potassium bichromate, and 0·5 per cent. of sodium fluoride, and exposed to light. Wood treated in this fashion is rendered completely indestructible by moulds.—Gabriel **Bertrand**: The extraordinary sensibility of *Aspergillus niger* towards manganese.—F. **d'Herelle**: The propagation in the Argentine Republic of the Mexican locust disease. Cultures of *Cocobacillus acridiorum* were used with great success to destroy the plague of locusts in the province of Santa-Fé, and the Argentine Government has decided to make use of this in all places attacked by these insects.

BOOKS RECEIVED.

Bad Reichenhall als klimatischer Kurort. By Drs. B. Alexander and E. Alt. Pp. 64+iv tables. (München: Otto Gmelin.)

Grundlinien der Pflanzen-morphologie im Lichte der Palaeontologie. By Prof. H. Potonié. Zweite Auflage. Pp. vii+259. (Jena: G. Fischer.) 7 marks.

Markose. By Prof. Max Verworn. Pp. iii+37. (Jena: G. Fischer.) 1 mark.

Observations on the West of England Mining Region. By J. H. Collins. Pp. xxiv+683+xviii plates. (Plymouth: Printed by W. Brendon and Son, Ltd.)

A Manual of Veterinary Physiology. By Major-General F. Smith, C.B., C.M.G. Pp. xii+808. (London: Baillière, Tindall and Cox.) 18*s*. net.

Theoretische Astronomie. By Prof. W. Klinkerfues. Neubearbeitung by Prof. H. Buchholz. Pp. xxxviii+1070. (Braunschweig: F. Vieweg & Sohn.) 50 marks.

Byways in British Archæology. By W. Johnson. Pp. xii+529. (Cambridge: University Press.) 10*s*. 6*d*. net.

Thoughts on Ultimate Problems. By F. W. Frankland. Fifth and revised edition. Pp. xv+133. (London: D. Nutt.) 1*s*. 6*d*. net.

Annals of the Royal Botanic Garden, Calcutta. Vol. xii., part i.: Asiatic Palms—Lepidocaryeae. Part ii.: The Species of Daemonorops. By Dr. O. Beccari. 2 vols. Vol. i., Letterpress. Pp. vii+237. Vol. ii., Plates. Pp. vii+109 plates. (Calcutta: