

Societies and Academies.

LONDON.

Geological Society, November 9.—Mr. R. D. Oldham, president, in the chair.—L. D. Stamp and S. W. Wooldridge: The igneous and associated rocks of Llanwrtyd (Brecon). Pt. 1: Stratigraphical (L. D. S.). The succession of rocks is given; the fossils from the lower horizon include *Dicranograptus rectus*, Hopkinson, *Glyptograptus teretiusculus*, var. *siccatus*, Elles and Wood, and *Climacograptus schärenbergi*, Lapworth; those from the higher horizon include *Dicellograptus sextans*, Hall, and var. *exilis*, Elles and Wood, and *Glyptograptus teretiusculus*, var. *siccatus*, Elles and Wood. Both assemblages are characteristic of the Dicranograptus shales of South Wales. The volcanic rocks of Llanwrtyd are therefore of lowest Bala (Survey classification) and on the same horizon as the upper basic and upper acid series of Cader Idris. The igneous rocks are cut off on the west by a fault, into which an intrusive mass appears to have been forced. Pt. 2: Petrographical (S. W. W.). The Lower Ashes are an acid series, of which the most characteristic member is a coarse flinty breccia. The spilites show pillow-structure in the upper part, but pass down into massive, finely vesicular rocks. The spilites are locally associated with spilite-breccias, consisting of angular fragments of various rocks and rounded bombs, of all sizes, of spilitic material. The bands of fine ash frequently interbedded with the sediments form dark flinty rocks weathering white. The intrusion is an enstatite-bearing rock of doubtful affinities.—L. D. Stamp: The base of the Devonian, with special reference to the Welsh borderland. The Ludlow Bone-bed forms a natural base: it consists of fish remains, all of which first appear at this horizon, and are genetically connected with higher Devonian faunas; it passes laterally into a conglomerate, and thus forms a natural physical base; it marks a palæontological and lithological break which can be correlated all over north-western Europe. The fauna of the lower beds (Ludlow Bone-bed, Downton-Castle Sandstone, and Platyschisma Shales) falls into three groups:—(a) Upper Ludlovian marine species which survived the change of conditions indicated by the bone-bed, but gradually died out; (b) species which flourished for a short time under the changing conditions; and (c) new forms, chiefly fishes, which persist, or are closely connected with later Devonian forms. It is suggested, from the association of the early Downtonian fishes with marine invertebrates, that the former could live in either salt or brackish water, but gradually became specialised.

Royal Meteorological Society, November 16.—Mr. R. H. Hooker, president, in the chair.—H. Jeffreys: The dynamics of wind. Winds can be divided into three main groups according as the pressure differences between places at the same level are mainly occupied in producing acceleration relative to the ground, in guiding the wind under the influence of the earth's rotation or in overcoming friction. They are called Eulerian, geostrophic, and antitriptic respectively. Tropical cyclones and tornadoes are Eulerian, while all winds of side extent are approximately geostrophic; sea and land breezes and mountain and valley winds are mainly antitriptic. Temperature differences will account for the annual pressure variation in Asia, and probably for the permanent winds of Antarctica. In the case of mountain and sea breezes a fundamental part is played by the deviation of the actual average temperature lapse-rate from the adiabatic value.—N. K. Johnson: The behaviour of pilot-balloons at great heights. Wind-structure in the

upper atmosphere is generally investigated by following a pilot-balloon by means of a theodolite, though at a few stations the balloon is followed by two theodolites situated at the ends of a base-line. Single-theodolite determinations rest fundamentally upon the assumption that the rate of ascent of the balloon is uniform. When a pilot-balloon is observed with two theodolites at the ends of a base-line the actual height of the balloon is calculated from minute to minute, and this method affords a means of testing the accuracy of the single-theodolite method. Experiments on the leakage of pilot-balloons are also detailed. It is concluded that the results of single-theodolite pilot-balloon ascents carried to great heights must be received with great caution.—C. J. P. Cave: The cloud phenomenon of November 29, 1920. On November 29, 1920, a cloud with a sharp-cut edge passed across the east of England, and was observed as far north as Worksop, Nottinghamshire, and as far south as Hawkhurst, Kent. The cloud moved from the west; in front the sky was clear, behind completely overcast. The progress of the front has been mapped from sunshine records and observers' notes, and the upper-air conditions have been investigated.

Royal Microscopical Society, November 16.—Mr. D. J. Scourfield, vice-president, in the chair.—G. Patchin: The micro-examination of metals, with special reference to silver, gold, and the platinum metals. The presence of foreign bodies, the existence of small quantities of metals, metalloids, etc., which may or may not exert an injurious effect on the material, the constitution of alloys, and the distribution of constituents throughout the metallic mass in relation to the micro-examination of metals, were discussed briefly. The presence of platinum and the platinum metals in gold, silver, and gold-silver alloys and the effect of small quantities of these metals on the surface appearance of cupellation beads were described.—W. C. Crawley and H. A. Baylis: Mermis parasitic on ants of the genus *Lasius*. The winged females of ants of the genus *Lasius* frequently show structural peculiarities, especially stunted wings and atrophy of the ovary, which are the result of infection with a Nematode worm. As Nematodes of this family (*Mermithidæ*) remain in a larval condition until after emerging from their hosts, complete description of them involves keeping them alive until they attain maturity. This has been done with the form found in *Lasius alienus*, *L. flavus*, and *L. niger*. No mature males of the worm were obtained; since the larvæ were found to have a precociously-developed male gland, the species is possibly a protandrous hermaphrodite. This view is supported by the observation that oviposition begins before or during the shedding of the last larval cuticle.—R. L. Frink: The practical value of the microscope in glass manufacture. The use of the microscope as a preventive control in selecting raw materials used as constituents of glass batch and refractories and materials for furnaces and the detection by means of the microscope of the causes of striæ or cords, stones, seeds, blisters, and other defects in glassware were described. The value of supplementing the polariscope tests of the annealing of glass by microscopical tests was also urged.

Linnean Society, November 17.—Dr. A. Smith Woodward, president, in the chair.—A. Smith Woodward: A newly-discovered human skull from the Rhodesia Broken Hill Exploration Company's mine in N.W. Rhodesia. The skull evidently belonged to an extinct race of cave-men, with a skull much resembling that

of the European cave-men of the Neanderthal race, but with an erect skeleton.—A. W. Hill: A visit to the Cameroons and Nigeria. The settlement of Victoria and the Botanic Garden there were described. Connected with this garden are the experimental plots of tea and cinchona at Buea, at an altitude of 3300–3600 ft. on the Cameroon Mountain. The Bauchi Plateau, Northern Provinces, was visited, and arrangements were made for collecting specimens of the local flora. More than 600 specimens, comprising a large proportion of new species, have been sent to Kew. The flora of the plateau shows affinities with the flora of Abyssinia and Nyasaland.

PARIS.

Academy of Sciences, November 14.—M. Georges Lemoine in the chair.—P. Painlevé: Gravitation in the mechanics of Newton and in the mechanics of Einstein.—M. Hamy: A particular case of diffraction of the images of the circular stars and the determination of their diameters.—L. Fabry: New formulæ for the calculation of the line of search of a minor planet.—MM. Gonnessiat and Renaux: An asteroid with an orbit resembling that of a comet. This planet (1920 HZ) was discovered by M. Baade at the Babelsberg Observatory, and he noted its comet-like orbit. Between December 1, 1920, and March 2, 1921, eight positions of this star were obtained with the photographic equatorial of Algiers Observatory, from which the provisional elements have been calculated. The orbit reaches to the distance of Saturn, but the image is clearly that of a planet, and not a comet. Additional observations are desirable before the end of the year, as it will not return for thirteen years.—B. Dérmendjian: A new demonstration of a theorem of M. Picard, and some generalisations of this theorem.—J. Kampé de Fériet: The general integral of the systems of partial differential equations of hypergeometric functions of higher order.—A. Lévy: Recurrent series and the homogeneous forms depending on them.—R. Gosse: Two new types of partial differential equations of the second order and of the first class.—J. Chazy: The arbitrary functions appearing in the ds^2 of the Einstein gravitation.—R. Guillery: Testing machines giving the elastic limit and the modulus of elasticity of metals.—K. Ogura: The theory of gravitation in space of two dimensions.—J. Chappuis and Hubert-Desprez: Researches on stray currents. The stray currents in the soil (of Paris) are produced by insulation defects of the tramway networks (550 volts, continuous current), and cause considerable damage to water and gas mains. Two methods have been worked out for identifying the leaky circuit, one based on the telephone, the other on the lamp with three electrodes. The latter proved to be the better method.—L. Bouchet: The variation with time of the pressures created in insulating fluids by a constant electrostatic field. The change with time may be interpreted in several ways, the most probable being the assumption that there is a change in the conductivity of the liquid. The effects observed with alternating currents were applied to calculate the specific inductive capacities of the six hydrocarbons used in the experiments.—P. Lemay and L. Jaloustre: The oxidising properties of certain radio-active elements. The experiments were made with the bromides of mesothorium, radiothorium, thorium-X, and radium. If solutions of these salts, enclosed in bulbs, are placed in the oxidisable solutions, there is no action, but when intimately mixed, oxidation phenomena were observed with hydroquinone, tincture of guaiacum, ferrous salts, and acid solutions of iodides.—P. Glangaud: The Plomb du Cantal, a large independent volcano, covering nearly a

third of the Cantal massif. This region has hitherto been considered as representing a sector of the great Cantalian volcano with a single crater. The author's observations lead to the conclusion that the Plomb du Cantal is an independent volcano, the principal eruptive centre of which was asymmetric with respect to its lava streams.—P. Loisel: The radio-activity of the springs of the region of Bagnoles-de-l'Orne. The eight springs examined all proved to be radio-active, but in different degrees. In four of them, all coming from granite, the radio-activity was permanent. The variations are discussed from the point of view of a double origin of the water from the spring.—Ed. Le Danois: The variations of the Atlantic waters off the French coasts.—J. Eriksson: New biological studies on the rust of mallow, *Puccinia Malvacearum*.—J. Ripert: The biology of the belladonna alkaloids.—P. Freundler, and Miles. Y. Menager and Y. Laurent: Iodine in the Laminaria. There is a loss of iodine, which may amount to 50 per cent. of the amount originally present, when the algæ are dried. The percentage of iodine is almost independent of the place of growth, but varies with the time of year.—A. Némec and F. Duchon: The possibility of determining the value of seeds by the biochemical method. An attempt to find a relation between the different enzymes present in the seed and the power of germination. The hydrolysing diastases can persist after the seed has lost its germinating power. But catalase behaves differently, and the activity of the catalase may serve to evaluate in a few minutes the agricultural value of the seeds.—G. Hinard and R. Fillon: The chemical composition of the starfish. Dried starfish contain about 50 per cent. of calcium carbonate, 35 per cent. of albumenoids, and 7 per cent. of fat, and serve well for manure. The fat has been extracted, and some of its chemical and physical constants are given.—R. Bayeux: The subcutaneous absorption of oxygen in mountain climbing or ascent by aeroplane.—A. Tournay: The influence of the sympathetic nerve on the sensibility: the effects of the resection of the sympathetic on the residual sensibility of a member the nerves of which have been almost completely severed.—A. Labbé: Heterogeneous impregnation.—P. de Beauchamp: Biogeographical researches on the tidal zone at the island of Yeu.—R. Poisson: Brachypterism and apterism in the genus *Gerris*.—M. Aynaud: Contagious pustulous stomatitis in sheep and goats.—G. B. de Toni: Material for the reconstruction of the manuscript A of Leonardo da Vinci in the library of the Institute.

BRUSSELS.

Royal Academy of Belgium, November 5.—M. G. Cesàro in the chair.—C. Servais: The geometry of the tetrahedron.—L. Godeaux: A rational involution with three points of coincidence belonging to an algebraic surface of the third species.

Books Received.

Wages and the Cost of Living. By Dr. C. V. Drysdale. Pp. 51. (London: Malthusian League.) 6d.

The Malthusian Doctrine and its Modern Aspects. By Dr. C. V. Drysdale. Pp. 68. (London: Malthusian League.)

Problems made Easy for Preparatory Schools and the Lower Forms in Public Schools. By R. Tootell. Pp. 75. (Winchester: Warren and Son, Ltd.) 3s. net.

Alternating Currents. By G. C. Lamb. Part 1. Pp. viii+73. Part 2. Pp. viii+127. (Cambridge: