

Societies and Academies.

LONDON.

Royal Society, November 8.—A. S. Parkes: Studies on the sex-ratio and related phenomena—foetal retrogression in mice. By means of *corpora lutea* counts it was found that in mice the average amount of foetal mortality leading to retrogression was 10.8 per 100 normal foetuses. Daniel and King have shown for mice and rats respectively that the does may become pregnant at the oestrus period which follows within twenty-four hours after parturition, and that the gestation period of the second litter is prolonged in some cases as much as ten days. This abnormal prolongation of the embryonic stages, which is due to inhibited implantation in the uterine *mucosa*, can be used experimentally to determine the effect of unusually adverse conditions upon embryonic and foetal mortality. Where the previous young were suckled less than six days, the amount of mortality rose to 17.6 per 100 normal foetuses, while in prolonged gestations resulting from continued suckling of previous young, the amount of mortality was further increased to 23.1. The sex-ratio of young born in these two classes was respectively 80.4 and 62.1 males per 100 females. Since the normal sex-ratio of mice is not far from equality, this inverse correlation between the amount of foetal mortality and the sex-ratio of the surviving foetuses suggests that mortality during gestation falls preponderatingly upon the males.—R. A. Fisher: The influence of rainfall on the yield of wheat. The Rothamsted data for rainfall and wheat yields extend to 1854; these data have been utilised to calculate the average effect on the yield of rain at different periods of the harvest year, for plots under 13 different manurial treatments. An extension of the method of partial correlation, applicable when the number of independent variates is very large and can be arranged in a continuous series, is used. The several plots show marked differences in their response to rain, showing that it is not impossible for the farmer to adapt his manurial treatment to a wet or dry season. A large part of the differences may be ascribed to the effects of loss of soil nitrates by percolation; other effects not susceptible to this explanation, and not hitherto anticipated, include the losses on the highly nitrogenous plots due to late summer rain. The residual value of artificial nitrogenous manures appears from these results to be considerably greater than has been thought.—D. Thursby-Pelham: The placentation of *Hyrax Capensis*. The early development of Hyrax is unknown, but there is no embedding of the blastocyst which undergoes its development in the uterine lumen. The maternal epithelium is destroyed early by the trophoblast on all sides. The trophoblast is differentiated into two cytotrophoblastic layers:—(1) basal phagocytic layer (basal trophoblast); (2) cellular network enclosing lacunae of maternal blood (inner trophoblast). The placentation throws little light on the affinities of Hyrax. While it agrees with the placenta of rodents in being hæmochorial, it differs in its zonyary form and the detailed character of its trophoblast. Superficially it bears some resemblance to the placenta of *Elephas* in zonyary arrangement and great complexity of allantoic villi, but in Hyrax there is no syncytial layer of maternal tissue surrounding the villi as in *Elephas*. Our present knowledge of the placentation of Hyrax tends to emphasise the isolated position the order occupies among Eutheria.

Physical Society, October 26.—Dr. Alexander Russell in the chair.—S. H. Piper and E. N. Grindley:

The fine structure of some sodium salts of the fatty acids in soap curds. X-ray photographs of certain sodium salts of the fatty acids (soap curds) show lines due to reflections from planes with very wide spacings of the order 40 Å.U. These planar spacings increase uniformly with the number of CH₂ groups in the molecule, indicating an effective length of 1.25 Å.U. for the CH₂ group. These and other lines can be accounted for by assuming that the curds are in the smectic state described by Friedel.—E. A. Owen and G. D. Preston: X-ray analysis of solid solutions. The atomic structure of solid solutions of copper-aluminium, aluminium-magnesium, and copper-nickel has been examined by the X-ray spectrometer. In each case it was found that the solute atom replaces an atom in the lattice of the solvent, the substitution being accompanied by a distortion of the lattice. The eutectic alloy of aluminium and copper consists of a mixture of two distinct substances with different space lattices, one being CuAl₂ and the other a substance the space lattice of which cannot be distinguished from that of pure aluminium. The intermetallic compound CuAl₂ possesses a simple tetragonal lattice of side 4.28 Å.U. and axial ratio 0.562, the copper atoms being at the corners and the aluminium atoms at the centres of the four small faces. The atomic structure of the compound CuAl resembles that of a solid solution of aluminium in copper, but the distortion is considerably greater. The material has a face centred trigonal lattice of side 3.89 Å.U. and an angle between the axes of 94.6°, the III planes being composed alternately of aluminium and copper atoms.—H. Chatley: Cohesion. The consequences are discussed of assuming that the alternately positive and negative atoms in a crystal may be treated as doublets attracting according to an inverse fourth-power law, while the electron fields surrounding the atomic nuclei repel according to an inverse tenth-power law. The numerical results agree fairly well with the facts as regards the strain which produces rupture in solids, and as regards the rate of change of compressibility with compression in liquids.

Linnean Society, November 1.—Dr. A. B. Rendle, president, in the chair.—S. Garside: The forms of *Hypoxis stellata*, Linn. f., a South African species of Amaryllidaceæ. Four varieties are distinguished, one of these as yet undescribed. In each case the varieties have constant vegetative characters, but the flowers show a considerable range of colour variation of a "continuous" kind. Important cytological characters of the upper epidermis of the perianth lobes were described, with particular reference to the remarkable iridescent areas which occur in some varieties. Habitat may considerably influence the size of the plant, but the varietal characters remain constant.—H. A. Baylis: The host-distribution of parasitic thread-worms (nematodes). The nematodes parasitic in vertebrates show great variety in the extent to which they are limited to particular hosts. They may be divided broadly into a section with more or less strict "specificity" and a section with members occurring in various hosts, often of quite distantly related groups. Many of the latter have an intermediate host (commonly an invertebrate) during their earlier phases, and these forms, being introduced into the final host at a more advanced stage than those which have a direct development, may be better able to adapt themselves to a variety of final hosts. Among forms with a direct development, those which show the strictest specificity are probably the most specialised, this being often correlated with specialisation, in habits

or otherwise, of the hosts, while those which have a wide range have retained a primitive adaptability.—**W. N. Edwards**: On the cuticular structure of the Devonian plant *Psilophyton*. Specimens of *Psilophyton princeps*, Dawson, from Gaspé (New Brunswick) in which the cuticle is preserved, show that as in the early land plants of the Rhynie Chert the stem is provided with stomata. These resemble in size and distribution the stomata of *Asteroxylon* but have cuticle thickenings. No stomata were seen on the highly cuticularised spines, but these spines do not resemble intumescences of *Rhynia*, and *Psilophyton* is probably nearer to *Asteroxylon*.

Aristotelian Society, November 5.—**Prof. T. Percy Nunn**, president, in the chair.—**T. P. Nunn**: (Presidential address) Scientific objects and common-sense things. The greatest achievement of the physical sciences is generally held to be the discovery, behind the veil of common-sense things and observable events, of a world of scientific objects and unobservable events. The primary qualities of common-sense things are transferred without difficulty to scientific objects. Size, mass, and motion, for example, belong to an electron in the same sense in which they belong to a flying bullet or to a planet. Their materiality being thus assumed, these objects have constantly increased their hold upon the scientific mind. The philosophical question involved in this concept is whether objects can exist which only possess the primary qualities of common-sense things and have none of their secondary qualities. To resolve this problem we must have a satisfactory theory of the common-sense thing. Such a theory is that a thing is a structure embracing and actually consisting of all the sense-data which common-sense regards as qualities of the thing and are presented to any percipient at any time or place. Unless this doctrine is hopelessly wrong, the pretension that scientific objects are the reality of which the common-sense world is but the appearance, must be entirely abandoned. The real achievement of science is not to have disclosed any reality behind the veil of sensible things, but to have greatly extended and deepened and rationalised the scheme of the world revealed in perception.

IPSWICH.

Prehistoric Society of East Anglia (Autumn London meeting), October 10.—**H. Bury** (Presidential address): The distribution of palæoliths in the Hampshire basin, with special reference to a "palæolithic horizon" separating levels at which implements are common from those in which they are extremely rare. This horizon indicates the highest altitude reached by the rivers in palæolithic times; the implements found at higher levels were buried during glacial conditions, when the normal drainage was temporarily obliterated. The differences in the level of the horizon in the Hampshire, Thames, and Somme Basins respectively (150 to 130 feet) are due to changes in the position of the river mouths, and not to local warpings of the earth's crust. There is clear evidence from the New Forest and Bournemouth Plateaux that the river fell and rose again in Lower Palæolithic times, the total range of movement (100 feet) agreeing exactly with the change from the third to the first terrace of the Somme, which Commont attributes to the Chellean period. But the English evidence makes it clear that the subsequent rise of the river (in or after Acheulean times) was much higher than Commont admits, and reached the extreme level of the Palæolithic horizon. The corresponding sea-level is more difficult to ascertain,

but evidence from the Isle of Wight points to 120 feet O.D.—**M. C. Burkitt**: The discovery in northern Spain of an industry which appears to be transitional between those of the late palæolithic and the opening of the neolithic ages. Masses of shells cemented to the roofs of certain caves on the coast of the Asturias are accompanied by a stone hand-pick made from a flat pebble fluted to a point, the butt and under side being unworked. This implement is found with the accompanying shell middens to overlay deposits containing the typical harpoons of the Azilian industry, and is evidently earlier than the early neolithic stage.—**L. Armstrong**: The excavations undertaken at Grimes' Graves, Norfolk, during the past summer. A survey of the site was made in 1922 to ascertain the level at which the floor-stone flint worked by the prehistoric miners outcropped in the adjoining valley. This season, aided by a grant from the Percy Sladen Memorial Trust, excavations were made with the view of determining whether a phase of mining could be traced on the hill slope earlier than the large galleried pits sunk from the top of the adjoining hill. A type of flint mine was discovered in which the radiating galleries were absent; descent was made by aid of rough steps left in the chalk; these were excavated by small hand-picks of splintered bone, which in one case was human. No trace of these pits can be detected on the surface; they are filled with an extremely compact deposit of chalk. Thus they are in direct contrast to the conditions in the long-known pits of Grimes' Graves, which seems to indicate a more ancient period of working. A glacial disturbance of the sides of the valley has thrust up a series of blocks of the flint towards the surface, which would probably attract the attention of the flint hunters.—**A. G. Wade**: Ancient flint-mines at Stoke Down, Sussex (*v. NATURE*, October 20, p. 597).

PARIS.

Academy of Sciences, October 22.—**M. Albin Haller** in the chair.—**H. Deslandres**: An equatorial of a new type, named the table equatorial, intended especially for researches in physical astronomy.—**A. Châtelet**: The properties of finite Abelian groups.—**A. Bloch**: The paratactic circles and the cyclid of Dupin.—**M. Hadamard**: Remarks on the preceding communication.—**Maurice Gevrey**: Some properties of quasi-analytical functions of one or more variables.—**Harald Bohr**: Nearly periodic functions.—**G. Valiron**: The theorem of Picard-Borel.—**A. Guillet**: The synchronisation of circular movements.—**M. Huguenard**: A method for the absolute measurement of the velocity of a current of air. This method utilises a novel principle. During the passage of an electric spark in air, in addition to the sound-wave, a little cloud of warm air is formed which can be rendered visible by means of a second spark placed on the axis of the first. If the air is moving, this cloud is carried along at the velocity of the air current and its position determined by eye for low velocities or photographically for high velocities. A diagram and description of the apparatus is given: it is not necessary to know the temperature or pressure of the gas nor the velocity of sound, and very high velocities can be readily measured by this method.—**Marius Pascal**: Observations on the note by M. P. Noaillon on "Superficial circulation."—**P. Idrac**: The structure of sea winds and their utilisation for hovering flight. A summary of the results of experiments on the movements of air currents over the sea, carried out during the autumn at the lighthouse of Jument d'Ouessant.—**Alex. Véronnet**: The evolution of the trajectory of a star in a resistant medium.

—W. W. Heinrich: The analytical prolongations of the limited problem.—Ladislas Gorczinski: The diminution of intensity in the red portion of the solar radiation, observed in Europe and at the equator. The measurements were made with bimetallic actinometers (Michelson system) furnished with coloured glasses. Between the equator and latitude 52° N. there is a progressive increase in the intensity of the red portion of the solar radiation as the distance from the equator increases.—P. Lambert, G. Déjardin, and D. Chalonge: An attempt to prove the existence, at high altitude, of a solar radiation in the extreme ultra-violet. Photographs of the solar spectrum were made with a specially designed spectrograph at the Vallot Observatory at the summit of Mt. Blanc, the experiments being specially directed to detect ultra-violet light between the wave lengths 1900 Å. and 2150 Å. The results were negative, no impression being shown by the plate after 40 minutes' exposure. It is suggested that oxygen may possess absorption bands in this region, and this point is to be the subject of further experiments.—F. Wolfers: The diffusion of the X-rays and Bragg's law. The work of Stenström, Siegbahn, Hjalmar, and Duane and Patterson has shown that Bragg's law, $n\lambda = 2a \sin \alpha$ is not rigorously true, the angles measured in the higher orders being a little too small. The author shows that it is possible to explain these deviations in a manner compatible with the quanta theory, assuming only that diffusion in a crystal of any substance is of the same nature. The deviations calculated from the theory thus developed are compared with the measurements of Hjalmar.—E. Darmois and J. Périn: Cryoscopy in $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$. The molecular magnitude of the malates, molybdates, and molybdomalates. Cryoscopic measurements show that these complex molybdic acids are all derived from two molecules of malic acid.—Paul Pascal: The constitution and evolution of the metallic oxides and hydroxides. Magnetic analysis serves to distinguish water of hydration from water of constitution. Applications of the method to the cases of cadmium hydroxide, magnesium hydroxide, and zinc hydroxide are given in detail.—P. Brenans and C. Prost: The *p*-iodoxybenzoic acids. Description of the preparation of the iodo-derivatives of para-oxybenzoic acid, $\text{C}_6\text{H}_4\text{I}(\text{OH})(\text{CO}_2\text{OH})$ (3:4:1) and $\text{C}_6\text{H}_3\text{I}_2(\text{OH})(\text{CO}_2\text{OH})$ (3,5:4:1).—E. Kohn-Abrest and J. Ricardoni: A new method of estimating hydrocyanic acid in cyanogenetic plants. The hydrocyanic acid is removed from the cold solution by means of a current of air passed for a period of eight hours.—A. Baldit: The trajectories of storms and their splitting up into two.—Marc Bridel and Pierre Delauney: The properties of loriglossin and its products of hydrolysis: glucose and loriglossigenine. Loriglossin, under the action of emulsin, gives glucose and a new substance, loriglossigenine. The latter has been obtained in the crystalline form, but in a quantity too small for complete analysis.—C. Fromageot: The influence of the concentration of salts in sea water on the assimilation of green Algae. The intensity of the photosynthesis varies appreciably with the concentration of the medium. There is an optimum saline concentration for the photosynthesis, and this concentration is precisely that of sea water.—F. W. T. Hunger: The nature of the cocoon pearl and its formation.—Georges Claude: The transformation of ammonia into fertiliser.—J. Athanasii: The nervous motive energy of the heart and the nature of the contraction of the myocardium.—Charles Benoit and André Helbronner: The antagonism of radiations. Physiological and therapeutic consequences. In the field of physiology, the effect of irradiation by ultra-violet

light is increased both in intensity and rapidity by a preliminary infra-red irradiation. On the other hand, the effects tend to be neutralised by a subsequent infra-red irradiation.—Jacques Pellegrin: A new apodal fish from the Bay of California, and its biology.—J. Legendre: The zoophilia of certain mosquitoes and its application to prophylaxy. In some regions *Culex pipiens* and *Anopheles maculipennis* both attack man, but it has been noted that at a coast station in Brittany, where these species are present together, neither attacks man. It is suggested that one of these insects might be used to suppress the other, and an experiment in this direction has been started.—A. Vandel: The existence and conditions of parthenogenesis in a terrestrial Isopod: *Trichoniscus (Spiloniscus) provisorius*.—A. Desgrez, H. Bierry, and F. Rathery: The utility of vitamin B and of levulose in the cure by insulin. The transitory effect of insulin in diabetes may be increased and prolonged by a suitable food regime. The addition of either vitamin B or levulose, or a mixture of both, allows the insulin injections to be made at longer intervals and thus increases the useful effect of a given amount of this substance.—Mme. J. Samuel Lattès: The corpuscular nature of the radiation responsible for the phenomenon of necrosis (produced by the X-rays) and on the best thickness of the filters.—M. Sluys: The creation of multiple foci of the secondary β -radiation in the middle of the tissues for a therapeutic purpose.—Charles Richet and Jean Célice: Local sera therapy in acute infantile gastroenteritis.

SYDNEY.

Linnean Society of New South Wales, August 29.—Mr. A. F. Basset Hull, president, in the chair.—Vera Irwin-Smith: Studies in life-histories of Australian Diptera Brachycera. ii. Asilidæ. No. 1. Catalogue of the species of Asilidæ of which the earlier stages have been recorded. Asilidæ. No. 2. Notes on the egg-laying, eggs and young larvæ of *Neoratus hercules* Wied. Larvæ were hatched from eggs laid by a female in captivity. The eggs were 1.1-1.2 mm. long and 0.40-0.43 mm. broad, and the newly-hatched larvæ were 2.2-2.6 mm. long. The eggs are distinguished by a characteristic pattern in dark pigment on the inner layer of the shell.—J. McLuckie: Studies in symbiosis. v. A contribution to the physiology of *Gastrodia sesamoides* (R.Br.). An account of the mycorrhiza and the bacteria associated with the rhizomes of the species, and their relation to the higher plant. The nutritive phase of the association of fungal hyphæ, bacteria and Orchid is also discussed.—J. M. Petrie: Studies in plant pigments. i. The yellow colouring-matter of the Acacias. Four different species of Acacia (*A. discolor*, *A. limifolia*, *A. decurrens* and *A. longifolia*) have been examined to ascertain the nature of the colouring matter of their yellow inflorescences. The water soluble yellow pigment was a glucoside of kæmpferol, which exists in the flowers as a rhamnose glucoside; no free flavonol was found. The Acacia tannins were composed of phloroglucinol, protocatechuic and gallic acids and deposited on hydrolysis large amounts of red phlobaphene anhydrides. The carotin and xanthophyll as plastid pigments were present in amounts from 0.14 to 0.3 per cent., and the flavonol about 0.06 per cent. of the fresh flowers.—E. W. Ferguson: Revision of the Amycterides (Coleoptera). Pt. viii. The Euomides. There is no single character separating this group from the remainder of the subfamily. All the described species are reviewed and in many cases redescribed from the types. The descriptions of ten new species and two new varieties are included.