

Societies and Academies.

LONDON.

Royal Society, June 1.—Sir Charles Sherrington, president, in the chair.—T. H. Morgan: The mechanism of heredity (Croonian lecture). The changes taking place when the germ-cells ripen are such that, granting the hereditary elements are carried by the chromosomes, the changes can serve as a mechanism, furnishing an explanation of the principles of heredity discovered by Mendel. In the course of the ripening of the germ-cells, irregularities occur at times in the distribution of the chromosomes, which can be followed in successive generations. The departures from the ordinary course of inheritance that are there shown, are found to be *exactly* related to the new distributions of the chromosomes. The facts furnish convincing testimony that the Mendelian characters are carried by the chromosomes. By the aid of the phenomenon known as "crossing-over" it is possible to determine that the hereditary elements lie in a single line in each chromosome. It is even possible to form a rough estimate of the upper limits of size of these elements, although at present such estimates are necessarily very crude, and are interesting only as the first attempt to determine the size of the "gene."

Geological Society, May 24.—Prof. A. C. Seward, president, in the chair.—A. C. Seward: Geological notes on western Greenland. Many localities were visited on the northern and north-eastern coasts of Disco Island, on the coast of Nugsuak Peninsula, also Hare Island, Upernivik Island, Ritenbenk, Sarkak, and Jakobs-havn. Greenland is nearly 1700 miles long, with an average breadth of about 600 miles; approximately a hundred glaciers from the inland ice reach the sea, the largest of which, Humboldt Glacier, ends in a cliff 60 miles broad. Various forms of icebergs were seen. An account of the characteristic types of vegetation and the physical and geological features of Greenland was followed by a more detailed description of the Cretaceous and Tertiary sedimentary series of Disco Island and the Nugsuak Peninsula, and of the overlying and protecting basalts which in some places rest directly upon the old Archæan land-surface, to the exclusion of the sedimentary series. Most of the sedimentary rocks are freshwater in origin and there is evidence of recent sinking of parts of the western coast.

Linnean Society, June 1.—Dr. A. Smith Woodward, president, in the chair.—A. C. Seward: A study in contrasts: The past and present distribution of certain ferns (Hooker lecture). Ferns spread by vegetative means, and the lightness and resistant nature of their spores make them very successful as colonisers and emigrants. When Treub visited Krakatau three years after its violent volcanic eruption, he found eleven species of ferns as pioneers of the new flora. As a class, ferns are cosmopolitan, though certain of them are strictly limited in their range and highly sensitive to the influence of physical or climatic conditions, e.g. the Bracken, *Cystopteris fragilis*, and *Polystichum Lonchitis*. The apparent identity of living with dead plants gives reality to Hooker's idea expressed in one of his letters: "Geology gives no evidence of a progression in plants. I do not say that this is a proof of there *never* having been a progression—that is quite a different matter—but the fact that there is less structural difference between the recognisable representatives of Conifers, Cycadeæ, Lycopodiaceæ, etc., and Dicotyledons of the chalk and those of the present day, than between the animals of those periods and their living representa-

tives, appears to me a very remarkable fact." The unfolding of plant-life through successive stages of earth-history shows a series of outbursts of energy; the records of one period tell us nothing, while those of the next reveal a fresh type of vegetation or, it may be, a single genus in possession of widely scattered regions of the world. The beginnings are always hidden from us. Between the Mesozoic and the Palæozoic records there appears to be a wide gulf. The difficulty of making direct contact between the age of pteridosperms and the succeeding age of ferns may be due to the difficulty of determining whether a Palæozoic fern-like frond should be classed as a pteridosperm or a true fern. In the latter part of the Triassic period we seem to pass suddenly to a new phase of plant evolution which may be intimately associated with some far-reaching event in the physical history of the earth's crust. Possibly crustal foldings in the latter part of the Palæozoic era, and the prevalence of desert or semi-arid conditions over wide regions during a part of the Triassic period, were vital factors influencing the progress of plant development. The rocks accessible cannot give all the clues sought; parts of old continents remain but others are beyond our reach.

The Optical Society, June 8.—Sir Frank Dyson, president, in the chair.—J. Guild: Angle comparators of high precision for the goniometry of prisms. The method of substitution is utilised. Measurements accurate to 1"-2" can readily be made, and with a more elaborate arrangement an accuracy of about 0.1" is possible. For the latter, minute variations in the direction of a beam of light emerging from a collimator, caused by placing near the focal plane of the latter a "variable prism" of simple design, are measured.—T. Smith: The changes in aberrations when the object and stop are moved. If the aberrations of any centred optical system are known, both for an object which intersects all rays transmitted by the system and for the centre of the effective stop, the position in the image space of the emergent portion of a given incident ray is known, and the aberrations in the image of any other object for any stop position can be expressed in terms of those for the first object. The relations in the second case are expressed in terms of the first when the objects are planes normal to the axis of symmetry.—T. Smith: The classification of optical instruments. Five classes are proposed, based upon the separation of the four Gaussian constants into two groups according to their signs. This classification cannot be modified by the addition to the system of inverting prisms and the like, and the properties usually associated with the sign of the lens depend upon its class according to the new system. Each class may have systems of positive or of negative power.—T. Smith and L. M. Gillman: Note on achromatism with one glass. Systems composed of thin lenses of the same kind of glass, and achromatised by selecting suitable positions for the components, are members of the class (AD) (BC), so that if the object is real the image is virtual. Achromatic systems constructed from normal achromatic lenses belong to the same class. The aberrations for systems constructed of a single glass, but belonging to other classes, are of considerable magnitude.—H. S. Ryland: An improved subjective test for astigmatism. The test apparatus consists of an opaque disc perforated along two diameters at right angles with a series of square apertures. These apertures and the distances between them subtend angles of 1° at the usual testing distance. The plate is illuminated by diffused light from the rear.

DUBLIN.

Royal Dublin Society, May 23.—Dr. F. E. Hackett in the chair.—H. A. Lafferty, and G. H. Pethybridge: On a *Phytophthora* parasitic on apples which has both amphigynous and paragynous antheridia; and on allied species which show the same phenomenon. The *Phytophthora* in question is *P. Syringæ* (Klebahn) and not *P. Cactorum* (Schroet), which has several times been found causing decay of apples both in Europe and America. In addition to these two species *P. Fagi* also produces two kinds of antheridia. The grouping of the twenty-two species of *Phytophthora* is discussed and the elimination of the recently erected genus *Nozemia* proposed. The economic significance of this form of apple rot is small.—A. G. G. Leonard and Miss A. M. Richardson: The occurrence of helium and argon in the boiling well at St. Edmundsbury, Lucan, Co. Dublin. The gas from the well consists almost completely of "nitrogen" with small quantities of carbon dioxide. The removal of nitrogen and carbon dioxide leaves a small amount of residual gas consisting of argon and helium. The percentages of argon and helium are 0.95 and 0.074 respectively.—H. H. Poole: Some further notes on the distribution of activity in radium therapy. Tables are given showing the approximate distribution of activity for different arrangements of emanation needles, and the skin activities with tubular applicators of various diameters and thicknesses.

PARIS.

Academy of Sciences, May 29.—M. Albin Haller in the chair.—The president announced the death of M. Ernest Solvay, at the age of 84 years.—L. Maquenne and E. Demoussy: Plant growth in media poor in oxygen. Seeds of radish, pea, wheat, and rape germinated in sterile sand and wholly submerged in running water gave seedlings possessing an assimilation capacity comparable with a normal plant. If a small proportion of carbon dioxide is added, the weight of the dry-plant material is higher than, or at least equal to, the weight of the original seed. The leaves of certain species of plants (sorrel, *Aucuba*) can retain their vitality in the absence of air for a long period.—M. Riquier: The singular integral figures of partial systems of the first order to which the method of integration of Jacobi applies.—E. Mathias, C. A. Crommelin, and H. Kamerlingh Onnes: The heat of vaporisation and the difference $m'-m$ of the specific heats in the saturated state for argon, oxygen, nitrogen, and hydrogen.—M. Henri Lebesgue was elected a member of the Section of Geometry in the place of the late C. Jordan.—F. H. Murray: Drawing arcs of circles of large radius.—J. W. Lindeberg: The law of Gauss.—P. J. Myrberg: Automorph functions of several independent variables.—M. Ferrier: The deviations of light rays passing in the neighbourhood of a star. A theoretical study of the deviations caused by the atmosphere of a star. This is superposed on the Einstein effect, and in certain cases might mask the latter. The cases of the Earth and Moon are worked out in detail.—J. Guillaume: Observations of the Skjellerup comet, made with the *coudé* equatorial of the Observatory of Lyons. Positions are given for six consecutive days, May 19-24, together with the positions of the comparison stars. The comet is vaguely circular, of about 0.5' diameter and without marked condensation.—Mlle. O. Jasse: Observations of the comet 1922b (Skjellerup), made at the Observatory of Marseilles (Eichens equatorial, 26 cm. aperture). One position is given, for May 24.—A. Danjon: A new interference method for measuring the apparent

diameter of stars. The Jamin system of thick plates is utilised. If the star has no appreciable apparent diameter it disappears completely when passing over the centre of a dark band, but if there is an appreciable disc the extinction will be incomplete. A formula is given for the maximum and minimum brightness, and the determination of the diameter is reduced to the photometric measurement of the maximum and minimum brightness when the star is observed through the interferometer. Experiments have been carried out on an artificial star, but the successful application of the method will depend on the influence of the movements of the atmosphere.—Gustave Guillaumin: The plane lines of slipping of pulverent, coherent, or plastic bodies.—Jean Lecarme: Experiments relating to the course of a pendulum and a chronometer, carried out at Chamonix and at the Mont Blanc Observatory, between August 1 and September 10, 1921. The chronometers were checked by the wireless signals from the Eiffel Tower and showed an unexplained loss of 30 seconds per day. The values of g at Paris, Chamonix, and the summit of Mont Blanc were determined by the pendulum and compared with the calculated figures.—S. Zaremba: The relativist conception of space.—Louis G. Stokvis: The circular diagrams of unbalanced triphase systems and the definition of their degree of lack of balance.—H. Weiss and P. Henry: The influence of the time factor on the interpenetration of solids by chemical reaction. Experiments were made on two pairs of metals—silver-antimony and copper-antimony. The depth of interpenetration was determined for varying times and temperatures, and the results given graphically.—Joseph Blondeau: Study of some dialkyl benzyl cyanides and the corresponding alcohols, amides, amines, and acids.—R. Locquin and Sung Wouseng: The action of acetylene on the sodium derivatives of ketones and the preparation of the dialkylethynyl-carbinols. The sodium derivative of the ketone was prepared by the action of sodium amide on the ketone in ether or benzene. This is then allowed to react with purified acetylene with continual agitation and the product decomposed with ice-water. Starting with the ketone $R.CO.R'$ the alcohol $R.R'.C(OH).C\equiv CH$ is obtained. The generality of the method is shown by its application to four ketones.—L. Blaringhem: Sex heredity in *Lychnis vespertina*.—A. Lécaillon: The fecundity of hybrids obtained by crossing the male *Dafila acuta* with the female *Anas boschas*. These hybrids form an exception to the general rule and are fertile.—W. R. Thompson: Mathematical study of the action of insect-destroying parasites. Duration of the parasitic cycle and the increase of the proportion of parasite hosts.—Emile F. Terroine and René Wurmser: The energy yield in the growth of *Aspergillus Niger*. This mould growing in a glucose medium, after certain corrections are made, accounts for 66-70 per cent. of the energy of the glucose. It is pointed out that Fingerling, Kohler, and Reinhardt have obtained values of the same order in the case of the growth of the pig.—MM. Georges Bourguignon and Conduché: Experiments on the introduction of the iodine ion by electrolysis in man, and its elimination by the urine.

SYDNEY.

Linnean Society of New South Wales, March 29.—Mr. G. A. Waterhouse, president, in the chair.—G. A. Waterhouse (Annual Address): (I.) The need for a zoological survey of Australia. The fauna of Australia is a national asset, although probably the finest collections of the Australian fauna will be found in museums outside Australia. Systematic zoological survey has not been attempted. Im-

mediate steps might be taken by the Commonwealth Government to institute a Federal Museum, in which could be gathered together specimens of Australian animals and accurate information concerning their distribution. Doubtless many private individuals would donate part of their collections to form the nucleus of such a display of the Australian fauna. (II.) Breeding experiments with the Satyrine genus *Tisiphone*. The genus *Tisiphone* is confined to the coast and Main Dividing Range of eastern and south-eastern Australia, and the *T. abeona* extends, with six sub-species, from southern Queensland into Victoria, but specimens from a small area round Port Macquarie appeared to be natural hybrids. In October 1920, pupæ and larvæ of *T. morrissi* were obtained from Urunga, at the mouth of the Bellingen River, and reared. Similarly, larvæ of *T. abeona* from near Sydney were reared. Crosses were obtained and the work carried to the third generation. The results afford some proof that *T. joanna* is a natural hybrid. The distribution of *Tisiphone* may help in elucidating the physiography of eastern Australia in Tertiary time. Possibly before the uplifting movement at the end of the Pliocene the ancestor of *Tisiphone* was in eastern Australia, and became restricted to the higher elevations where moisture was more abundant. The Cassilis Gap was responsible for discontinuous distribution and development took place independently north and south of this Gap. Later the northern and southern forms were able to reach the coast, and where they met the very complex race *T. joanna* was developed.—W. F. Blakely: The Loranthaceæ of Australia. Pt. I. The range and origin of the family were given and the seeds and germination, parasitism, union with the host, adventitious roots, mimicry, dispersal and agents of distribution described.—Vera Irwin-Smith: Notes on nematodes of the genus *Physaloptera*, with special reference to those parasitic in reptiles. Pt. II. A review of the *Physaloptera* of lizards. The characters useful in the determination of the various species received particular attention.—Marguerite Henry: A monograph of the freshwater Entomostraca of New South Wales. Pt. I. Cladocera. Descriptions of fifty species, belonging to seventeen genera, were given; five of the species are new and the presence of others in Australia is recorded for the first time.

April 26.—Mr. G. A. Waterhouse, president, in the chair.—H. J. Carter: Australian Coleoptera: Notes and new species. No. ii. A series of Chalcotania, together with a table of the Australian species, and some Australian species of Stigmodera are described. Eight species of Buprestidæ, eleven species of Tenebrionidæ, and one genus and five species of Cistelidæ are new.—E. Muir: A new genus of Australian Cixiidæ (Homoptera). The new genus is allied to *Leptoclamys* Kirk. Specimens were collected near Sydney. The abnormal development of the front legs indicates that the nymph is probably subterranean in its habits.—T. Harvey Johnston and O. W. Tiegs: New gyrodactyloid trematodes from Australian fishes, together with a reclassification of the super-family Gyrodactyloidea. The first species of monogenetic Trematoda belonging to the Gyrodactylidæ from Australasia are described. The hosts comprise seven species of freshwater fish and five species of marine fish. A new super-family and five new sub-families are proposed. In addition to the new Australian genera five others are proposed, mainly for North American species. All the known freshwater species show affinities with Australian marine species, thus emphasising the marine origin of the Australian freshwater fish fauna.

Official Publications Received.

Fifty-third Annual Report of the Trustees of the American Museum of Natural History, for the Year 1921. Pp. 259. (New York.)
Koninklijk Nederlandsch Meteorologisch Instituut. No. 106. Ergebnisse aerologische Beobachtungen. 9. 1920. Pp. x+176. (Utrecht: Kemink en Zoon.) 3.00 F.
Sitzungsberichte der physikalisch-medizinischen Sozietät in Erlangen. 52 und 53 Band, 1920-1921. Pp. xix+221. (Erlangen: M. Menecke.)

Diary of Societies.

FRIDAY, JUNE 23.

ROYAL SOCIETY OF ARTS (Indian Section), at 4.30.—F. W. Woods: Irrigation Enterprise in India.
PHYSICAL SOCIETY OF LONDON (at Imperial College of Science and Technology), at 5.—J. W. Fisher: An Experiment on Molecular Gyrostatic Action.—Prof. A. O. Rankine and C. J. Smith: The Viscous Properties and Molecular Dimensions of Silicane.—W. N. Bond: The Pressure-Gradient in Liquids flowing through Cones.—Dr. E. E. Fournier d'Albe: Demonstration of a Mercury-drop Method of producing Visual Effects by Means of Sound.

MONDAY, JUNE 26.

MEDICAL OFFICERS OF SCHOOLS ASSOCIATION (at Medical Society of London), at 5.—Prof. F. S. Langmead, Dr. W. P. S. Branson, and Dr. James: Discussion on Cardiac Children as a Public Health Problem.
ROYAL SOCIETY OF MEDICINE (Odontology Section), at 8.—F. Coleman: Types of Difficult Extraction and their Treatment.
ROYAL INSTITUTE OF BRITISH ARCHITECTS, at 8.30.—Presentation of the Royal Gold Medal.
ROYAL GEOGRAPHICAL SOCIETY (at Æolian Hall), at 8.30.—R. A. Frazer: The Oxford Expedition to Spitsbergen, 1921.

TUESDAY, JUNE 27.

RESEARCH DEFENCE SOCIETY (Annual General Meeting) (at Medical Society of London), at 3.30.—Sir Walter Fletcher: Medical Research and National Life.
MINERALOGICAL SOCIETY (at Geological Society of London), at 5.30.—Dr. W. F. P. McIntock and S. E. Ennos: The Structure and Composition of the Strathmore Meteorite.—A. Brammall and H. F. Harwood: The Dartmoor Granite (part), its Petrology and Accessory Minerals.—H. F. Collins: Some Crystallised Sulphates from the Province of Huelva, Spain.—Prof. H. Hilton: The Graphical Determination of the Constants of a Shear.—Prof. H. Hilton: A Note on Crystallographic Notation.—A. F. Hallmond: Glauconite from Lewes.—Dr. L. J. Spencer: Ninth List of New Mineral Names.
ROYAL ANTHROPOLOGICAL INSTITUTE, at 8.15.—Prof. A. Mawer: The Study of English Place-names.
INSTITUTION OF CIVIL ENGINEERS, at 8.30.—Annual Conv ersazione.

WEDNESDAY, JUNE 28.

ROYAL SOCIETY OF ARTS (Annual General Meeting), at 4.
ROYAL SOCIETY OF MEDICINE, at 5.—Lt.-Col. H. Watkins-Pitchford: Thanatophidia, or Poisonous Snakes of Africa.
GEOLOGICAL SOCIETY OF LONDON, at 5.30.—C. E. Tilley: The Petrology of the Metamorphosed Rocks of Start District (South Devon).—Dr. A. R. Dwyerhouse: The Glaciations of the Counties of Antrim, Down, and Parts of Armagh, Londonderry, Tyrone, Monaghan, and Louth in Ireland.

THURSDAY, JUNE 29.

ROYAL SOCIETY, at 4.30.—*Probable Papers*.—Sir J. J. Thomson: The Analysis by Positive Rays of the Heavier Constituents of the Atmosphere; of the Gases in a Vessel, in which Radium Chloride had been stored for 14 Years, and of the Gases given off by Deflagrated Metals.—Sir Robert Hadfield, Bart.: The Corrosion of Iron and Steel.—Dr. W. B. Dawson: Harmonic Tidal Constants for Standard Ports of Reference in Canada.—Prof. J. C. McLennan and M. L. Clark: The Excitation of Characteristic X-rays from Light Elements.—J. C. Bramwell: An Abnormal Relationship of the Electrical to the Mechanical Response in the Ventricles.—T. S. P. Strangeways: Observations on the Changes seen in Living Cells during Growth and Division.
FELLOWSHIP OF MEDICINE (at Royal Society of Medicine), at 5.—H. J. Paterson: The Diagnosis of Gastric Disease.
INSTITUTION OF ELECTRICAL ENGINEERS (at the Natural History Museum), at 8.30.—Annual Conv ersazione.
ROYAL SOCIETY OF MEDICINE (Urology Section), at 8.30.—Sir Thomas Horder: Report on Renal Function. Tests.—K. Walker: The Accessory Sexual Glands of the Rhinoceros, the Flying Wombat, the Ornithorhynchus, the Zebra, and the Tapir.

FRIDAY, JUNE 30.

ASSOCIATION OF ECONOMIC BIOLOGISTS (at the Royal Horticultural Society's Gardens, Wisley), leaving London 11.15-11.30 A.M.—Annual Field Meeting.
ROYAL SOCIETY OF MEDICINE (Laryngology Section), at 4.45.

PUBLIC LECTURE.

(The number in brackets indicates the number of the lecture in the series.)

TUESDAY, JUNE 27.

KING'S COLLEGE, at 5.30.—Miss Hilda D. Oakeley: The Idea of Value in the History of Philosophy (2).