

Early Science at the Royal Society.

May 26, 1670. Dr. Croune acquainted the Society that Sir Nicholas Millet had mentioned to him, and Mr. Hooke, that he had a manuscript of his own writing, which contained the observations of the variations of the needle made for seventeen or eighteen years in the same place. They were desired to procure a sight and perusal of that manuscript.

May 27, 1663. Upon the reading of a letter sent out of Ireland to the Secretary, concerning the expectation, which the committee, that had heretofore given the society an account of Sir William Petty's new ship, entertained of hearing the sense of the society thereupon; it was ordered, That the committee should be put in mind by the secretary, that the matter of navigation being a state concern was not proper to be managed by the society: and that Sir William Petty, for his private satisfaction, may, when he pleases, have the sense (if he hath it not already) of particular members of the society, concerning his new invention.

1685. Mr. Hooke observed [in discussion] that the scarlet-red windowglass was brought from Germany; but that there had been none brought over for eighty years past.

May 28, 1668. The president produced an Italian letter written to himself as president, by the Prince and Cardinal Leopold de Medicis, in answer to the letter written to him acknowledging the favour of his eminence's present of the Florentine experiments. The cardinal's letter was read and ordered to be entered, and the favour and respect to the society expressed in it to be acknowledged on a proper occasion.

1673. Mr. Hoskyns produced a piece of silver ore, lent him by Captain Bertue, who had brought it out of Sweden, where, he said, in the Swedish Silverberg, they throw in coal over night into the rocky mine, and having let it burn and calcine all night, slake it the next day; whereupon the stony part being washed out of the ore by the water, the metal appears, as in this piece, in long, thick, silvery streaks.

May 29, 1679. The Society then went to take a view of the new weather-clock, which was set up in Mr. Hunt's lodgings, made to keep an account of the quantity and time of all the changes, that happen in the air, as to its heat and cold, its dryness and moisture, its gravity and levity; as also of the time and quantity of the rain, snow, and hail that fall: all of which it sets down in a paper, so as to be very legible and certain.

1665. Mr. Howard having presented the society with several curious exotic plants and flowers, had their thanks, and was desired to continue these presents from time to time, that they might be put upon the table at the meeting of the society.

May 30, 1667. The duchess of Newcastle coming in, the experiments appointed for her entertainment were made.

1678. Sir Jonas Moore gave an account, that Mr. Edmund Halley, who went to the island of Saint Helena, in order to observe the true places of the stars near the south pole, was newly returned to England; and that he had completed his design by having taken the true places of above four hundred considerable stars: that the place of his observation was above a thousand yards higher than the surface of the sea: that by reason of that great height there were there almost continual clouds and mists, which passed very swiftly: that this mistiness and moisture of the air dissolved the glue of the tubes.

Societies and Academies.

LONDON.

Royal Society, May 22.—J. W. Gregory and C. J. Gregory: The geology and physical geography of Chinese Tibet, and its relations to the mountain system of South-Eastern Asia. The continuation of the Himalayan System eastward from India has been suggested on two lines—one N.E. into Northern China and the other S. through Western Burma to the Eastern Archipelago. In a journey across this region in 1922 the authors found that in addition to the N. and S. strike, due to movements of Hercynian age in the later Palæozoic, there was clear evidence of transverse Kainozoic disturbances, such as should accompany an extension of the Himalayan axis into S.W. China. Marine rocks were found belonging to the Devonian, with a reef of Stromatoporoids, and to the Carboniferous, Permian, and Triassic Periods. The Triassic limestones and the Permo-Triassic sandstones show evidence of widespread dislocation by over-thrusts and over-folds, which are certainly post-Hercynian, and are regarded as Himalayan. These movements have brought up blocks of older pre-Palæozoic rocks along E. to W. belts. The country is therefore regarded as having been folded by Himalayan movements, and afterwards fractured in the Pliocene along lines which trend predominantly N. and S., and have produced a series of tectonic basins. The authors do not accept the great uplift of S.E. Asia in the Pleistocene. The succession of earth-movements and volcanic eruptions in comparison with that of East Africa indicates that both areas were profoundly affected by the subsidence of the Indian Ocean.—Madge Kaye and Dorothy Jordan Lloyd: A histological and chemical investigation of the swelling of a fibrous tissue. The behaviour of a heterogeneous system, such as skin in water, acids and alkalies, differs in several important respects from that of a homogeneous system, such as gelatin. The fibres of skins are grouped into regular bundles and are divided longitudinally into fine threadlike fibrils. These are embedded in a colourless semi-fluid matrix, the "inter-fibrillary substance," which has the characteristics of an albumen. The fibres and fibrils of fresh skin are in a state of internal strain, due to (a) the inherent structure of the fibril, and (b) their arrangement in the tissue. These strains are released when the fibres are swollen, but new temporary strains are produced by encircling threadlike elements binding the fibres together, which only become visible when the bundles are in a swollen condition. Drying introduces additional strains, but destroys the constricting bands. In swollen skins, water is present in at least two conditions—(a) imbibed between the fibres or fibrils, (b) combined with the internal substance of the fibrils. In fresh skins the inter-fibrillary albumen does not prevent absorption of water in either way, but the coagulated albumen of skin dried under the influence of heat or ultraviolet light offers considerable resistance to both. Skins dried under conditions which do not coagulate albumen are brought nearer to fresh skins; solutions which disperse coagulated albumen increase the power of water-absorption of dried skins, but some irreversible changes seem to occur in drying.—C. H. Browning, J. B. Cohen, S. Ellingworth, and R. Gulbransen: The antiseptic action of compounds of the apocyanine, carbocyanine, and isocyanine series. In general, these substances are very powerfully antiseptic towards *Staphylococcus aureus*, but are much less active towards *B. coli*. In the presence of serum their antiseptic action is practically as well

marked as in watery medium. Unlike the acridine series, the introduction of amino-groups did not enhance the action of the cyanine compounds. In the isocyanine series the introduction of side-chains into the quinoline fraction of the molecule, as compared with their presence in the quinaldine fraction, had a depressing effect on antiseptic potency. Otherwise significant alterations in antiseptic power were not observed as a result of variations in chemical structure within the groups.—H. J. Watt: Dimensions of the labyrinth correlated. The dimensions of the semicircular canals of mammals (and birds), like those of the cochlea, are highly correlated with one another and with the length of the head and body, so that they may be said to maintain a typical form, varying in scale with the length of the head and body. They show no noteworthy signs of variation from type, except that the dimensions of the canals in the porpoise and the Cape sea-lion are relatively unusually low, while the dimensions of the body and head of the whale, the sea-cow, and the horse are relatively unusually high.

Linnean Society, May 1.—Dr. A. B. Rendle, president, in the chair.—E. Clement: Seedlings of *Odontoglossum*, *Dendrobium*, *Cattleya*, and *Cymbidium* germinated without fungal aid. Bernard and Knudson succeeded in inducing germination by chemical means, but all previous success was gained with seeds which are easily germinated. The present cultures showed that, with suitable media, about 90 per cent. of *Odontoglossum* seeds will germinate, and normal growth continues after transfer from the medium to potting materials.—J. Gray: Some problems in experimental cytology. Analysis of the ciliated cells in the gills of *Mytilus* indicates that although most of the main constituents of sea-water are intimately connected with the normal conditions, the only factors which vary in such a way as to cause a variation in ciliary activities are the temperature of the sea, and the accumulation of carbon dioxide when the animals are stranded at low tide. The effect of carbon dioxide is such as to cause an effective guard against the destructive effect of a lack of oxygen. Certain problems peculiar to dividing cells can also be attacked by experimental methods. The view that the astral rays are comparable to muscle fibrils, cleaving the cell by a process of contractions, is completely at variance with the fact that the process of cytoplasmic cleavage is unaccompanied by any change in the oxygen consumption of the cells. There is a steady increase in the rate of oxygen consumption as growth proceeds, but it is not to be associated with any particular phase of nuclear activity. Experiments can also be made on the effect of a cell on the structure or activity of neighbouring cells. In some cases intercellular processes exist, but in the case of *Spirochata balbani* there occurs a synchronisation of movement of individuals which are only in contact by their anterior end.

Zoological Society, May 6.—Prof. E. W. MacBride, vice-president, in the chair.—R. Broom: On some points in the structure of the Pareiasaurian skull.—D. M. S. Watson: The Elasmosaurid shoulder-girdle and fore-limb.

Geological Society, May 7.—Dr. J. W. Evans, president, in the chair.—Mrs. Ethel Gertrude Woods and Miss Margaret Chorley Crosfield: The Silurian rocks of the Clwydian Range, from Moel Arthur to Gyrn. The Clwydian Range forms part of a complex anticlinal fold of Silurian rocks, folded and faulted into position between the New Red Sandstone of the Vale of Clwyd on the west, and the Carboniferous

Limestone of the North Wales Coalfield on the east. The part of the range mapped consists, in detail, of a number of synclines and anticlines of Lower Ludlow age, running nearly due east and west in the north, and more north-west to south-east in the south. The nature of the deposits shows contrasting conditions of deposition, from a still-water, landlocked area, subject to rhythmic changes, to an open-sea, near-shore area with abundance of clastic material, followed by a partial return to earlier conditions. The beds form part of the pre-Carboniferous floor of North Wales. Subjected as they have been to the strong Caledonian forces, they show many signs, not only of yielding to and resistance to pressure, but also of having moved with a certain amount of individual freedom. The chief valleys all run in a Caledonian or sub-Caledonian direction. The contrasting pitch of the beds in the north and south, and the change in direction of folds and faults, shows that the Moel Fammau block (consisting of Moel Fammau itself and the region east of it) has acted as a pivotal line, about which the regions north and south have swung, the torsional movement being greater in the south than in the north.

Optical Society, May 8.—E. A. H. French: The preparation of coppered glass mirrors. An earlier research on this subject was conducted by Chattaway in 1907, using phenylhydrazine as a reducing agent, but on his findings it was not possible to obtain a coherent copper film on plate glass surfaces. This was probably due to the formation of tarry by-products, which appear inevitably to result when such a reducing agent is used. Experiments were conducted at the War Department Searchlight Experimental Establishment with the object of eliminating this drawback, as well as temperature difficulties insuperable from the use of phenylhydrazine. It was found that a satisfactory coherent and lasting film can be deposited on plate glass surfaces at a comparatively low temperature by the use of hydrazine sulphate. The cleaning of the glass surface is peculiarly important.—H. W. Lee: The Taylor-Hobson F/2 anastigmat. The lens has proved useful in theatrical photography, since by its use the actual performance on the stage can be photographed with the ordinary stage lighting. It also permits of kinema photographs being taken with less intensely actinic light than is at present used in kinematograph studios. In astronomy the new lens should prove useful. Its large angular field, combined with its large linear aperture, makes it possible to plot star fields very rapidly. It should also be possible to photograph meteors. The illumination in the meteor image depends on the aperture ratio and the quality of definition of the lens, and the large field is a necessity.—T. Smith: A reference system for primary aberrations. It is proposed to employ as a complete reference system for primary aberrations, the state of correction of spherical aberration along the whole axis. Such a system is advantageous, since it involves no arbitrary choice of object and stop positions.

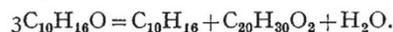
Royal Statistical Society, May 20.—M. Greenwood: The mortality statistics of Sweden and of England and Wales: an essay in international comparison. Seventy or eighty years ago male mortality from childhood to the age of 35 was greater in England and Wales than in Sweden, and less at ages over 40; the mortalities of females in the two countries bore a similar relation one to the other, but absolutely the English rate was higher at all ages. In the decennium 1901-10 the relative positions were completely reversed. During this period English young and

adolescent rates had improved extraordinarily, mortality at ages 40-50 relatively little; Swedish adolescent mortality, on the contrary, showed little change, while at later ages the rate had improved almost 50 per cent. In the seventy years which preceded 1910 the prosperity of the United Kingdom increased far more than that of Sweden, but the mortality in the less prosperous country at the ages of maximal productivity, 30 to 60, became increasingly better. Looking upon a birth as an investment of life capital, and years lived between 20 and 60 as national interest on the investment, in which country does the investment pay better? In Sweden every 1000 male live-births yield 28,378 years of life between 20 and 60, in England and Wales 26,317; in females the yields are 29,205 and 27,921 respectively; *i.e.* male life capital earns 7 per cent. more interest and female 4.5 per cent more than in England. The higher adolescent mortality of Sweden has not neutralised the advantage of the lesser infantile mortality which her figures continue to show.

PARIS.

Academy of Sciences, May 5.—M. Guillaume Bigourdan in the chair.—Charles Moureu, Charles Dufraisse, and Jacques Panier des Touches: Auto-oxidation and anti-oxygen action. The catalytic properties of the iodo-phenols. It has been shown in earlier communications that both phenols and iodine and its compounds possess marked catalytic properties in the phenomena of auto-oxidation. It is now found that iodo-phenols have practically the same catalytic effect on the oxidation of acrolein as the corresponding non-substituted phenols.—P. Bazy: Urinary suppuration, without micro-organisms being present and non-tuberculous.—W. Kilian and Antonin Lanquine: The tectonic of the outermost Alps between Chabrières and Moustiers-Sainte-Marie (Basse-Alpes) and on the facies of the strata which constitute them.—Edmond Beecher Wilson was elected correspondant for the section of anatomy and zoology in succession to the late M. Loeb.—A. Angelesco: Poisson's integral in the complex domain.—Maurice Fréchet: The notion of dimension in functional fields.—Charles Rabut: The conditions of security of massive barrages.—L. Escande and M. Ricaud: The similitude of hydraulic movements.—A. Buhl: The ametric tensorial calculus.—E. Brylinski: Some equations of electromagnetic dimensions.—J. Granier: The conductivity of electrolytes at very high frequencies. The range of wave-length used was from 43,500 metres to 3.8 metres. Preliminary experiments appeared to show a change in the resistance with the wave-length, but after the systematic study of various causes of error, the author concludes that there is no appreciable change in the conductivity of the electrolytes examined with the wave-length.—A. Dauvillier: Preliminary measurements of intensity in the high-frequency spectra of the elements.—F. Baldet: The spectra of the thermionic discharge in carbon monoxide. A new band spectrum.—Max Morand: The spectrum of the light emitted by the stoppage of the positive rays of lithium.—Jean Lecomte: Qualitative studies on the infra-red absorption spectra of organic bodies.—H. Chipart: General properties of optically active media.—Pierre Auger: The secondary β -rays produced in a gas by the X-rays.—G. Bruhat and M. Pauthenier: The destruction of carbon bisulphide by the ultra-violet rays. A mercury arc lamp focussed on a glass cell containing carbon bisulphide gives a deposit of sulphur in a few seconds. If the quartz plate forming the side of the cell is lightly half-silvered, silver sulphide is formed by the action of the rays, and a sort

of photograph of the ultra-violet spectrum is obtained.—Germaine Cauquil: The esterification of some homologues of cyclohexanol.—Paul Pascal: The plurality of the insoluble alkaline metaphosphates.—Pierre Jolibois and L. Chassevent: Solutions of calcium sulphate.—E. Darmois: The melting-points of mixtures of camphene and pinene. Remarks on a recent note by M. Austerweil.—V. Auger and Mlle. I. Robin: A basic zinc acetate analogous to the acetate of beryllium. Anhydrous zinc acetate, heated to 250° in a good vacuum, gives a crystalline sublimate of a basic zinc acetate $Zn_4O(C_2H_3O_2)_6$. The basic beryllium acetate of Urbain and Lacombe $[Be_4O(C_2H_3O_2)_6]$ resembles the zinc compound in its composition, volatility, and crystalline form (octahedra).—M. Picon: The effect of heat on hydrated sodium thiosulphate and sodium sulphite in a vacuum.—A. Kling and M. and Mme. A. Lassieur: Study of the separation of aluminium and iron from zinc, manganese, and nickel by the basic acetate method.—Marcel Oswald and Robert Pinta: The treatment of coals with liquid naphthalene. Working in an atmosphere of nitrogen, liquid naphthalene at the temperature of its boiling-point dissolved from 12 to 18 per cent. of the coals examined.—P. Brenans and C. Prost: A new *p*-iodoxybenzoic acid. The starting-point for the preparation of this acid was nitroanthranilic acid: the acid $[1.4.2].C_6H_3(CO_2H).(OH)I$ was obtained.—M. Bourguet: A partial dehydration of aldehyde and ketones leading to the production of acetylenic hydrocarbons.—Georges Dupont: An hypothesis on the related origins of the terpenes and the crystallised acids constituting the resins of conifers. Accepting the view of Köhler that the substance secreted by the resin-producing cells is an aldehyde of the composition $C_{10}H_{16}O$, the author's hypothesis is that the terpene and resin acid are produced by diastatic action according to the equation



This requires that the terpene and acid must exist in definite proportions in the crude turpentine, and this has been verified by the author for some turpentines.—H. Gault, Frédéric A. Hessel, and Yervante Altchidjian: The pyrogenic dissociation of the acyclic hydrocarbons.—M. Lespieau: The preparation of true doubly acetylenic hydrocarbons. A description of the preparation of $CH:C(CH_2)_7.C\equiv CH$ and $CH:C(CH_2)_{12}.C:CH$.—Albert Baldit: Magnetic measurements in the south of France. The magnetic elements (reduced to January 1, 1922) are given for 47 stations, of which 14 are new points.—A. Hée: The intensity of respiration in plants and the law of size.—André Broca and Turchini: The movements of the eyes.—Alphonse Labbé: The curious sensitive organs of the male allomorphs of *Eurytemora velox*.

Official Publications Received.

- Journal and Proceedings of the Royal Society of Western Australia. Vol. 9, Part 2, 1923. Pp. 121. (Perth.) 5s.
 Report of the Marlborough College Natural History Society for the Year ending Christmas, 1923. No. 72. Pp. 115. (Marlborough.)
 Papers and Proceedings of the Royal Society of Tasmania for the Year 1923. Pp. v+188+13 plates. (Hobart: Tasmanian Museum.) 10s.
 The Indian Forest Records. Vol. 10, Part 6: General Volume Tables for *Sal (Shorea robusta)* Classified by Diameter and Height. By S. H. Howard. Pp. iii+58+7 plates. (Delhi: Government Central Press.) 1.7 rupees.
 Survey of India. General Report for 1922-23: from 1st October 1922 to 30th September 1923. Prepared under the Direction of Col. C. H. D. Rider. Pp. vii+61+7 maps. (Calcutta: Survey of India.) 2 rupees; 4s.
 Department of Commerce: Bureau of Standards. Technologic Papers of the Bureau of Standards, No. 254: Emissive Tests of Paints for decreasing or increasing Heat Radiation from Surfaces. By W. W. Coblenz and C. W. Hughes. Pp. 171-187. (Washington: Government Printing Office.) 5 cents.
 Union of South Africa. Report of the South African Museum for the Year ended 31st December 1923. Pp. ii+14. (Cape Town.)