

views as to the inadequate character of the remuneration received by the great majority of men of science. Professors and investigators should have, he maintains, adequate incomes, as large as is desirable for any social class, but above all they should have opportunity to lead a life free from distracting or dishonourable compromises. If the maximum income of a university professor or man of science with a family should be from 1000*l.* to 2000*l.*, no one, says Prof. Cattell, should receive more, except to cover greater risks. There is no occupation requiring rarer ability or more prolonged preliminary training, and there is none the services of which to society are greater. If there are to be money prizes—incomes of 4000*l.* or 20,000*l.* or more—then they should be open to professors and investigators. Scientific ability is as rare as executive or legal ability, and is far more valuable to society. The lawyer who receives a fee of 160,000*l.* for enabling a group of promoters to get ten times as much by evading the intent of the law does not add to the wealth of society. The man of science who increases the yield of the cereal crop by 1 per cent, adds 2,000,000*l.* a year to the wealth of the country and five times as much to the wealth of the world. The man of science who discovered and those who have developed the Bessemer process of making steel have, according to the estimate of Abram S. Hewitt, added 400,000,000*l.* yearly to the world's wealth. There is no reason, he urges, except the imperfect adjustments of society why the lawyer should receive large rewards and the man of science a scant salary.

### SOCIETIES AND ACADEMIES.

#### LONDON.

**Royal Society**, June 20.—Sir Archibald Geikie K.C.B., president, in the chair.—Dr. D. Ellis: An investigation into the life-history of *Cladothrix dichotoma* (Cohn).—Leonard Hill and Martin Flack: The relation between secretory and capillary pressure. I., the salivary secretion. The authors find that when the salivary secretion from the submaxillary gland is obstructed, and the salivary pressure during stimulation of the chorda tympani nerve rises above the arterial pressure, the outflow of venous blood from the gland continues. Under these conditions the gland feels very tense; by squeezing it the secretory pressure, which in some cases is nearly twice as high as the arterial pressure (e.g. 240 mm. Hg compared with 130 mm. Hg), is still further raised, while the flow of blood from the vein is stopped.—G. W. Ellis and J. A. Gardner: The origin and destiny of cholesterol in the animal organism. Part IX., on the cholesterol content of the tissues (other than liver) of rabbits under various diets and during inanition.—C. H. Martin: A note on the protozoa from sick soils, with some account of the life-cycle of a monad flagellate. On Russel and Hutchison's hypothesis that soil sickness is due to ingestion of soil bacteria by protozoa, these should be found in sick soils, capable of either leading a trophic life with the fairly low percentage of water found in dry soils (viz. 20 per cent. by volume), or else with a capacity of readily encysting and of reproducing with enormous rapidity as soon as the soil becomes saturated with the necessary amount of moisture. To throw some light on this question, cultures were made on agar plates from three different sick soils. It was noticed that each small sample of each soil for each culture condition gave rise to a fairly constant specific fauna, whereas samples of the other soils under these conditions have also given rise to constant, but quite distinct, faunas.—E. W. Ainley Walker: Further observations on the variability of Streptococci in rela-

tion to certain fermentation tests, together with some considerations bearing on its possible meaning. Observations have been continued on the variability of Streptococci in relation to Gordon's tests. These tests consist, in the main, in growing the micro-organisms concerned in the presence of particular carbohydrates and noting whether an acid reaction is or is not produced in the culture medium within a given period of time. It is believed by M. H. Gordon, who introduced the tests, that their application reveals the existence of distinct varieties among the micro-organisms grouped together under the term streptococcus. In previous communications evidence was presented to prove that this is not the case. Additional evidence is now brought forward supporting the same contention and leading to the conclusion that there is at present no proof of the existence of more than one kind of streptococcus pathogenetic for man.—Dr. A. Harden and W. J. Pentfold: The chemical action on glucose of a variety of *Bacillus coli communis* (Escherich) obtained by cultivation in presence of a chloroacetate (preliminary notice). The organism in question produces no gas when grown on glucose peptone water, aerobically, in a test-tube provided with a Durham gas tube; but when grown anaerobically in presence of chalk it yields an amount of hydrogen and carbon dioxide which is approximately 0.25–0.3 of that given by the normal organism. The amounts of alcohol and acetic acid are similarly diminished and that of lactic acid increased. The organism retains the power of decomposing formates.—V. J. Harding: The action of enzymes on hexose-phosphate.—Prof. F. Keeble and Dr. E. F. Armstrong: The oxydases of *Cytisus Adami*. The investigation was undertaken with a twofold object:—(1) To test Baur's hypothesis that this graft-hybrid is a peridinal chimera composed of an epidermis derived from *Cytisus purpureus* and a body derived from *C. laburnum*; (2) to ascertain whether migration of oxydases may occur in plants. The results confirm Baur's conclusions, and indicate that oxydases may pass from one tissue to another.

**Geological Society**, June 5.—Prof. W. W. Watts, vice-president, in the chair.—Prof. W. Boyd Dawkins: The further evidence of borings as to the range of the south-eastern coalfield and of the Palæozoic floor, and as to the thickness of the overlying strata. Two experimental borings carried out under the author's direction in 1910–11 led to unexpected results. Hitherto the Coal Measures were either horizontal, or dipping in the normal fashion without signs of faulting, and there was every reason to believe that the Coal-Measure trough would be struck, on the first site, at Chilham, about three miles south-west of Canterbury. Instead, however, of Coal Measures, Upper Silurian shales with *Monograptus priodon* formed the Palæozoic floor at 1072 ft. below O.D. In the second at Bobbing, near Sittingbourne, hard Silurian grits and shales occurred at 1070 ft. below O.D. In both borings the Silurian rocks are nearly vertical, and bear marks of crushing.—J. W. Stather: Shelly clay dredged from the Dogger Bank. The Dogger Bank fishermen frequently get in their nets a tough peaty material, which they call "moorlog." In looking over some recently dredged "moorlog" brought in by a Hull trawler, the author noticed that, adhering to the specimens of "moorlog," was a dark silty clay, full of marine shells. These specimens of "moorlog," with the associated shelly clay, were dredged in lat. 55° 24' N., and long. 3° 10' E., at a depth of twenty fathoms. A collection of these shells was submitted to Mr. Clement Reid, who stated that they are all assignable to very shallow-water species, and probably flourished just

beneath low-water level. This and other evidence seems to show that the "moorlog" in this part of the North Sea rests upon a bed of shelly silt, and the shells in the silt, together with the "moorlog," point to great changes of level in the North Sea Basin.

**Mineralogical Society, June 18.**—Dr. A. E. H. Tutton, vice-president, in the chair.—T. V. Barker: The isomorphism of the acid tartrates and tartar-emetics of potassium, rubidium, and caesium. The corrections of previous measurements of the three acid tartrates have been confirmed, and in addition the molecular volumes have been calculated; the properties of the three salts are found to exhibit a regular progression in order of molecular weight. Solutions of caesium tartar-emetic on evaporation yield syrups which refuse to crystallise, even when inoculated with a fragment of a salt presumably isomorphous with it. The rubidium salt, however, affords good crystals, which, contrary to previous observations, yield measurements almost identical with those of the corresponding thallium and ammonium salts, and fairly close to those of the potassium salt; there is therefore every indication that this group of salts presents relationships similar to those obtained by Tutton in the sulphate and selenate series. The eutropic character of potassium, rubidium, and caesium compounds was discussed in detail, and it was shown that not only the cases in which they exhibit isomorphism, but also those in which isopolymorphism is met with, unmistakably point to the intermediate position of rubidium.—W. F. P. McLintock and T. C. F. Hall: The topaz and beryl from the granite of Lundy Island. The granite consists essentially of quartz, orthoclase, albite, biotite, and muscovite, cordierite and garnet also being present. Well-shaped crystals of topaz and beryl line druses in the granite, and are associated with tourmaline, fluor, and apatite. The felspar of the druses is frequently kaolinised, and the orthoclase has in every case been affected first. It is suggested that carbonic acid was the principal agent in effecting the change, and that the alkaline carbonates produced attacked the topaz, the crystals of which are invariably etched, and are sometimes altered to a white secondary mica; the formation of the fluor is ascribed to the same period. R. H. Solly: The rathite group. The characters of the members of the group were discussed, and the similarity of angles in the prism zone was pointed out.—Dr. G. T. Prior: The minerals of the El Nakhla el Baharia meteorite. This meteoric stone consists of a fairly coarse-grained aggregate of green augite, a highly ferri-ferrous brown olivine, and a little interstitial felspar. The augite, which constitutes about three-quarters of the stone by weight, has a chemical composition approximating to a formula  $3\text{CaSiO}_3 \cdot 3\text{MgSiO}_3 \cdot 2\text{FeSiO}_3$ , a mean refractive index 1.685, double refraction 0.035 about, and optic axial angle  $2E=89^\circ$ . The olivine closely approaches hortonolite, except that it contains no manganese; it has a chemical composition represented by the formula  $2\text{Fe}_2\text{SiO}_4 \cdot \text{Mg}_2\text{SiO}_4$ , a mean refractive index 1.785 about, double refraction 0.050 about, and optic axial angle  $2V=67^\circ$ .—J. B. Scrivenor: Note on the occurrence of cassiterite and strüverite in Perak. The extent of the occurrence of strüverite was discussed, and specimens illustrating uncommon occurrences of tin-ore were exhibited and described.

#### PARIS.

**Academy of Sciences, June 17.**—M. Lippmann in the chair.—G. Bigourdan: A proposal relating to a general catalogue of nebulae and star clusters, and various questions relating to this proposal.—Emile Picard: The developments of Cauchy in exponential series

and on the transformation of M. André Léauté.—E. L. Bertin: The use of values in the ventilation of ships.—Armand Gautier and Paul Clausmann: The determination and colorimetric estimation of minute quantities of fluorine. A detailed description (with diagrams) of an apparatus for determining with precision fluorine in quantities from 0.1 to 2.0 milligrams.—H. Douville: An attempt at the phylogenetic classification of the Lamellibranchs.—A. Perot: The apparent movement of vapours in the solar atmosphere. Data concerning the C and F hydrogen lines, and the calcium line  $\lambda=6122$ .—Emile Borel: The theory of the logarithmic potential.—N. Lusin: The properties of measurable functions.—C. Carathéodory: The general theorem of M. Picard.—Henri Villat: The change of orientation of a given obstacle in a fluid current.—G. Millochau: Contribution to the study of dielectric effects in gases.—H. Malosse: The determination of the density of camphor by means of the densities of its solution in different liquids. By extrapolation from the densities of solutions of camphor of varying concentration in ten solvents, the value of 0.963 was found for the density of camphor in solution.—V. Auger: The alkaline periodates. A criticism of some conclusions of Garzarolli-Thurnlackh.—F. Dienert: The use of physico-chemical volumetric methods in the estimation of the mineral constituents of waters.—P. Mahler and E. Goutal: The use of oxygen under pressure for the determination of the total carbon in ferro-alloys. The method of direct combustion of iron and steel in compressed oxygen, described by the authors in a previous communication, has been successfully extended to alloys of iron with manganese, silicon, chromium, tungsten, vanadium, molybdenum, aluminium, and titanium.—G. Vavon: The catalytic addition of hydrogen to benzylidene-acetone.—Jules Frézouls: Some derivatives of hexahydrobenzoic aldehyde.—J. Pouget and D. Chouchak: The influence of the concentration of solutions of food substances on their absorption by plants.—P. Mazé: Researches on the relations between the plant and the nutritive elements of the soil. The law of the minimum and the law of the physiological ratios.—A. Magnan: The yield of eggs in ducks submitted to four different modes of feeding. The diets included meat, fish, insects, and vegetables, the number and weight of eggs being noted. Both the number and weight of eggs produced by a purely vegetarian diet were inferior to those produced by a meat or fish diet.—H. Bierry and Mlle. Lucie Fandard: Glycemia and animal temperature.—F. Le Cerf: Organs of adaptation in the adults of certain Lepidoptera.—M. Bounhiol: The determination of the age of the Algerian sardine. The ratio of the length of the body to the head length is utilised.—E. Vasticar: The existence of a double external fibre in Costi's organ.—N.-A. Barbieri: The colouring matter of yolk of egg or ovochromine.—J. Riban: Ambreine.—Mlle. E. Peyréga: Spectrography of the blood of *A. piscatorum*.—Mme. and M. Victor Henri: The stimulation of organisms by the ultra-violet rays.—Em. Bourquelot and M. Bridel: The synthetic action and hydrolysing action of emulsin in alcoholic solution. Emulsin determines the combination of glucose and alcohol,  $\beta$ -ethyl glucoside being formed.—Stanislas Meunier: Two French meteorites recently received at the museum, the fall of which passed unnoticed.—Pierre Bonnet: The Permian and Trias of Daralagöz.—Ph. Négris: The age of the crystalline formations of Attica.—A. Boutaric and G. Meslin: The influence of the solar eclipse of April 17, 1912, on the propagation of electrical oscillations.—M. de Montessus de Ballore: The seismogenic influence of epiprogonic movements.—J. Deprat: The succession of horizons of the lower and middle Trias in North Annam.