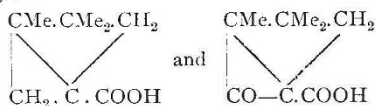


SOCIETIES AND ACADEMIES.

LONDON.

Chemical Society, November 4.—Prof. Dewar, President, in the chair. The following papers were read:—On the properties of liquid fluorine, by Profs. Moissan and Dewar (see page 82).—The liquefaction of air and the detection of impurities, by Prof. Dewar. The author has devised an apparatus for ascertaining the proportion of any gas in air that is not condensable at about -210° C. under atmosphere pressure, or is not soluble in the liquid air produced; the air to be examined is cooled in a tube immersed in a reservoir, which can be continuously replenished with liquid air boiling under diminished pressure. The gas which does not condense under these conditions can be subsequently collected and examined, or the liquefied portion of the air can be boiled in the condensing tube and the gas collected over mercury. On thus condensing 70 litres of the gas issuing from the King's Well at Bath, which Rayleigh has shown to contain 0.12 per cent. of helium by volume, a liquid was obtained which, when boiled, gave off first a gas containing about 50 per cent. of helium. It is concluded that helium is less soluble in liquid nitrogen than hydrogen is in liquid air, and that by proceeding as above helium can be separated from a gas in which it is present to the extent of only one part per thousand; it would seem, further, that hydrogen and helium have about the same volatility.—The absorption of hydrogen by palladium at high temperatures and pressures, by Prof. Dewar. The author, after summarising his previous work on the absorption of hydrogen by palladium, describes experiments made with the object of ascertaining whether the metal absorbs the gas at high temperatures and pressures; palladium does not absorb hydrogen under atmospheric pressures at above 145° C. A rod of palladium, weighing 119 grams, and occupying 10 c.c., was placed in a gas-tight steel cylinder, connected with a manometer, a compressed hydrogen cylinder, and a blow-off cock; the vessel containing the palladium could be heated in a bath of fusible metal. It was found that the palladium absorbed over 300 times its volume of hydrogen at 420° under 80 atmospheres pressure, whilst it absorbed 300 times its volume of the gas at 500° under 120 atmospheres. The experiments have led to the deduction of a number of interesting thermal constants for the absorbed hydrogen.—On some yellow vegetable colouring matters, by A. G. Perkin. The *Rhus rhodantha*, a tree indigenous to New South Wales, contains fisetin, $C_{15}H_{10}O_6$, and a glucoside of fisetin, $C_{36}H_{30}O_{16}$ resembling fustin, the fisetin glucoside present in *R. cotinus*.—Naphthylureas, by G. Young and E. Clark. The mononaphthylureas may be prepared by treating the naphthylamine hydrochlorides with potassium cyanate, and readily become converted into the symmetrical dinaphthylureas. — Benzoylphenylsemicarbazide, preliminary notice, by G. Young and H. Annable. Benzoylphenylsemicarbazide exists in three different forms, melting at $202-203^{\circ}$, $205-206^{\circ}$, and $210-211^{\circ}$ respectively.—Sulphocamphylic acid, by W. H. Perkin, jun. From the results of an investigation of sulphocamphylic acid, the author assigns the following probable constitutions to isolauronolic and isolauronic acid respectively:—



Geological Society, November 3.—Dr. Henry Hicks, F.R.S., President, in the chair.—The Secretary announced that Lady Prestwich had presented to the Society a half-length portrait in oils of the late Sir Joseph Prestwich, painted by Mr. W. E. Miller.—Mr. W. W. Watts gave details of some interesting geological features recently exposed at the new sewerage works at Carshalton, Surrey, now being made by the Urban District Council. These excavations are situated at a spot which on the Geological Survey map is coloured as London clay; and the features of the ground fully justified this colouring. The excavations, however, have shown that there are loamy and sandy beds of a light yellow colour, some 14 or 15 feet in thickness, and apparently occupying a hollow in the London clay. At the base these sandy beds become dark and clayey in some places, and include flints and pebbles, while below this is the London clay. In the dark pebbly layer were found a large skull, a piece of a tusk, and a number of smaller bones, which Mr. E. T. Newton has determined to be a piece

of elephant-tusk, the skull (31 inches long) of *Rhinoceros anti-quitatis* with some of its limb-bones; while the smaller bones represent two or perhaps three horses. Although the teeth of the rhinoceros are wanting, the skull is otherwise very perfect; and, bearing this in mind, as well as the fact that certain of the limb-bones were also found, and that *Elephas* is represented by the tusk, and all three (it is said) at a depth of 14 or 15 feet, little room is left for doubting that we have here at Carshalton a Pleistocene deposit of a somewhat unusual character, and at a spot where it was not before suspected. Mr. Whitaker, who was responsible for the geological mapping of this district, pointed out how the general configuration of the district gave no clue to the presence of this deposit of loamy sand, which occurred on a gentle slope, and that even now it was only possible to mark it on the map as an oval patch round the excavations with uncertain boundaries. The drift shown, moreover, differs from that of the neighbourhood in that the latter is essentially gravel, while the former is sand, with loamy beds, but, as a rule, not stony, so that there are no surface-indications of gravel. The mammalian remains are now preserved in the Museum of Practical Geology.—Lieut. General McMahon having taken the chair, the President made a communication regarding very similar deposits to those above described occurring in north-western Middlesex. Some years ago he described sections in glacial drift on the Hendon plateau exposed during sewerage operations. More recently the sewers have been carried on at lower levels between Hendon and Edgware, and numerous remains of the mammoth and rhinoceros have been found resting on an eroded surface of London clay, and covered over by about 7 feet of stratified sands and gravels and brick-earth. These deposits were found to spread out for considerable distances over the plain, and to be cut through also by the Silke stream, a tributary of the Brent. This area has hitherto been supposed to consist almost entirely of London clay, but the sections have now shown that the brick-earth which, in many respects, simulates the London clay, is underlain by deposits which must be classed as of Pleistocene age.—The President then resumed the chair, and Mr. H. B. Woodward called attention to a block of quartzite from Criccieth in Carnarvonshire, which had been sent for exhibition by Mr. G. J. Day. The rock contained a band of disrupted clayey material which presented on the surface of the block a rude resemblance to hieroglyphics. He thought that the curious structure had been produced on a sea-shore bounded by clay cliffs, where a film of mud had been spread over the sands; and that the mud had dried and curled up before other layers of sand had been accumulated on the top of it. Similar phenomena might be produced at the present day on the Cromer coast, where thin films of mud were in places spread over the sands of the sea-shore. It had been suggested that the appearances in the Criccieth stone might have been produced in the original deposit during the irregular solidification of the sand and its included layer of mud. The rock itself was regarded by the President as probably derived from the Harlech grits, in which he had observed somewhat similar features.—Mr. Bauerman, as one of the three delegates appointed by the Council on behalf of the Society to attend the recent International Geological Congress, held at St. Petersburg, gave a short account of the work of the Congress, dwelling more particularly on the excursion to the Ural Mountains, in which he had taken part.—The following communication was read: A contribution to the paleontology of the decapod Crustacea of England, by the late James Carter. This paper deals mainly with the Brachyura. The author describes several new species belonging to the genera *Nephrops*, *Gebia*, *Homolopsis*, *Ranina*, *Mithracia*, *Neptunus*, *Acteopsis*, and *Goniocyprida*. The genera *Gebia*, *Ranina*, and *Neptunus* have not been previously recorded from British rocks. *Diaulax* is for the first time identified from the Tertiary strata, a single specimen having been found in the Middle Headdon. *Platypodiia Oweni*, Bell, is now referred to the genus *Diaulax*; and *Paleocorystes Broderipi*, Bell, to the genus *Eucoorystes*. As a result of the careful study of large series of specimens in various collections, the author is able to give much additional information concerning the morphology of several species.

Zoological Society, November 16.—Dr. Albert Günther, F.R.S., Vice-President in the chair.—The Secretary read some notes, made by Mr. A. Thomson, Head-Keeper, on the breeding of two species of Glossy Ibis (*Plegadis guarauna* and *P. falcinellus*) in the Society's Gardens, and made remarks on the differences in their plumages. The Secretary also exhibited an

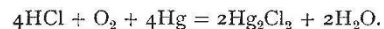
egg of the Brazilian Cariama (*Cariama cristata*), laid in the Society's Gardens, and read some notes made by Mr. A. Thomson, Head-Keeper, on the breeding of this bird.—Mr. Sclater gave an account of some of the more interesting animals observed by him during a recent visit to the Zoological Gardens of Cologne, St. Petersburg, Moscow and Berlin.—A note was read from Messrs. Oldfield Thomas and R. Lydekker, stating that during the preparation of their paper on the dentition of the Manatee, published in the last part of the *Proceedings*, an important memoir by Dr. C. Hartlaub on the subject, in which some of their conclusions had been anticipated, had been overlooked.—Mr. R. Lydekker, F.R.S., exhibited a skin of the Blue Bear of Tibet (*Ursus pruinosus*), described and figured in the Society's *Proceedings* (P. Z. S., 1897, p. 412, pl. xxvii.), and a sketch of the Altai Deer (*Cervus eustephanus*) taken from a specimen in the menagerie of the Duke of Bedford at Woburn Abbey.—A communication by Mr. George P. Mudge, "On the Myology of the Tongue of Parrots," was read by the author. Specimens of six different species of the *Psittacidae* had been examined, and a detailed description of the muscles of each of them was given in this paper.—A communication from Mr. E. T. Browne, "On British Medusæ," was read. It was a continuation of a previous paper, entitled "On British Hydroids and Medusæ," published in the *Proceedings* for 1896. Eight species were treated of at length.—Dr. A. G. Butler enumerated the species (138 in number) contained in three consignments of butterflies collected in Natal in 1896 and 1897 by Mr. Guy A. K. Marshall, and gave the dates of the capture of the specimens, the localities where they were found, and other interesting notes concerning them. One new genus (*Chrysoiritis*) and one new species (*Cacyreus marshalli*) were described. A communication from Mr. Edgar K. Waite, of the Australian Museum, Sydney, "On the Sydney Bush-Rat (*Mus arboricola*, W. S. Macleay)," was read. It treated of the habits of the animal in a wild state and of its anatomical characters.—A third portion of a paper on the spiders of the Island of St. Vincent, by M. E. Simon, was communicated by Dr. D. Sharpe, F.R.S., on behalf of the committee for investigating the fauna and flora of the West Indian Islands. Of the species enumerated forty-six were described as new, which included three new genera, viz. *Mysmenopsis*, *Homalometa*, and *Mesobria*.—Prof. Alfred Newton, F.R.S., exhibited some specimens of new or rare birds' eggs, and read some notes upon them. Amongst these were the first properly authenticated examples of the eggs of the Curlew-Sandpiper (*Tringa subarquata*) obtained by Mr. Popham on an island in the mouth of the Jenisei River in July last. Other eggs exhibited were those of *Turdus varius*, *Chasiempis sandvicensis*, *Himatione virens*, *Emberiza rustica*, and *Podoces panderi*.

Linnean Society, November 4.—Dr. A. Günther, F.R.S., President, in the chair.—Mr. F. G. Jackson, leader of the Jackson-Harmsworth Polar expedition, exhibited a series of lantern-slides, illustrating some zoological observations of the expedition, the most noteworthy being views of the hibernaculum of the polar bear and of the breeding haunts in Franz Josef Land of the ivory gull (*Pagophila eburnea*), the eggs of which were also shown.—Mr. H. Fisher, botanist of the expedition, brought for exhibition a collection of plants made by him in Franz Josef Land, the consideration of which was deferred for want of time.—Mr. Reginald Lodge exhibited some lantern-slides of marsh birds, their nests, eggs, and young, from photographs recently taken in Spain and Holland.—Sir John Lubbock, Bart., M.P., read a paper on the attraction of flowers for insects, which dealt chiefly with the points raised in three recently published memoirs by Prof. Plateau, who had attempted to show that the scents and not the colours of flowers serve to attract insects. Sir John Lubbock explained that his view, like that of Sprengel and Darwin, was that to insects flowers were indebted for both their scent and colour. Not only had the present shapes and outlines, colours, the scent, and the honey of flowers been gradually developed through the unconscious selection exercised by insects, but this applied even to minor points, such as the arrangement of lines, and the different shades of colour. Prof. Plateau had recorded a series of experiments on the dahlia, in which he showed that bees come to these flowers even when the ray-florets have been removed. Discussing this point, Sir J. Lubbock said it was somewhat singular that he should have selected as proving that insects are entirely attracted by scent a flower which had, so far as he knew, no scent at all. He gave several reasons for disputing

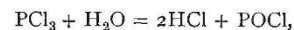
the conclusions drawn by Prof. Plateau from his experiments, and recorded others made by himself which refuted them. He had selected species of flowers in which the scent is in one part and the coloured leaves in another, as, for instance, the *Eryngium amethystinum*. This flower is surrounded by brilliant blue bracts; and he found that if the two parts were separated, the bees came more often to the bracts than they did to the flowers themselves. He maintained, therefore, that the observations of Prof. Plateau did not in any way weaken the conclusions which had been drawn by Sprengel, Darwin, and others, and that it was still clear that the colours of flowers serve to guide insects to the honey, and in this way secure cross-fertilisation.—Mr. W. C. Worsdell communicated a paper on transfusion-tissue, its origin and functions in the leaves of Gymnospermous plants.

PARIS.

Academy of Sciences, November 15.—M. A. Chatin in the chair.—Reaction of hydrogen upon sulphuric acid, by M. Berthelot. Sulphuric acid absorbs hydrogen completely at 25°, and even in the cold, during two months, 75 per cent. of the hydrogen present was absorbed, with production of a corresponding amount of sulphur dioxide. This reaction does not take place with the diluted acid. A thermo-chemical study shows that the dilution of the acid changes the thermal sign of the reaction.—Influence of oxygen upon the decomposition of the hydrazids by metals, and especially by mercury, by M. Berthelot. Although pure hydrogen chloride may be kept over mercury for several years without change, in the presence of oxygen there is a slow absorption, as a result of which the acid is wholly absorbed according to the equation



A similar reaction takes place between mercury, hydrogen sulphide, and oxygen. In both these cases there is an evolution of heat during the reaction.—Direct action of sulphuric acid upon mercury at the ordinary temperature, by M. Berthelot. Mercurous sulphate and sulphur dioxide are produced after long standing at ordinary temperatures.—Observations on the swarm of shooting stars, made at the Observatory of Paris, during the nights of November 13-14, 14-15, 1897, by M. Lœwy.—Influence of surfusion upon the freezing point of solutions of potassium chloride and sugar, by M. F. M. Raoult. The experiments quoted now definitely show that the molecular lowering of the freezing points for potassium chloride and sugar have limiting values agreeing with the predictions of Arrhenius.—On the integration of the equations of heat, by M. Le Roy.—Observations of the shooting stars at the Observatory of Meudon, by M. Hansky.—Observations on this communication, by M. J. Janssen.—The mechanical principles involved in the practical application of the mercury bath as a means of obtaining a true vertical, at the Paris Observatory, by M. Maurice Hamy.—On a generalised displacement in which all points describe spherical trajectories, by M. Ernest Duporcq.—On the theory of complete functions, by M. Erik Schou.—On the transmission of energy at a distance. Application to rotatory polarisation, by M. André Broca.—On the coefficients of expansion of gases, by M. A. Leduc. From the experimental results on the densities of gases previously given, a formula is derived for the true coefficient of expansion at 0° C. under a pressure of π cm. of mercury. This formula is applied to some twenty-three gases, and the figures obtained compared with the experimental results of M. P. Chappuis.—Action of water upon phosphorus trichloride, by M. A. Besson. Evidence is adduced of the existence of a phosphorus oxychloride, POCl, analogous to NOCl. It is formed by the action of a small quantity of water upon an excess of phosphorus trichloride, according to the equation



and is separated from the excess of the trichloride, by distillation in a vacuum. POCl forms a waxy solid, of the consistence of paraffin, which is insoluble except in PCl_3 . The yield is very small, never exceeding 0.2 to 0.5 gr. per kilogram of PCl_3 used.—On cerium, by M. O. Boudouard. By fractional crystallisation and precipitation of the acetate and sulphate of cerium it is found that cerium oxide is contaminated with small quantities of another earth possessing a lower atomic weight.—On the preparation of strontium sulphide by means of hydrogen sulphide and strontia or strontium carbonate. Influence of temperature,

by M. José Rodriguez Mourelo.—Production of volatile fatty acids from the waters used in the *désuintage* of wool, by MM. A. and P. Buisine. The acids obtained include acetic, propionic, butyric, valerianic, and caproic, the two first being the chief constituents.—On the decomposition of chloroform, bromoform, and choral by aqueous potash, by M. A. Desgrez. An aqueous solution of potash attacks chloroform slowly, with production of carbon monoxide. Light hastens the reaction. Bromoform behaves similarly, except that being much less soluble in water than chloroform, the action is less. Iodoform is not affected under the same conditions.—On silver cyanamide, by M. Paul Lemoult. A thermo-chemical paper.—Observations on the crabs of the family of the Dorippidia, by M. E. L. Bouvier. A contribution to the study of the evolution of the deep-sea crabs. The close analogy between the species found in West Indian seas and the Eastern Pacific leads to the conclusion that at no very distant period the oceans were connected at Panama.—On a new type (*Metchnikovella*) of organisms parasitic to *G. spionis*, Köll, by MM. Maurice Caullery and Félix Mesnil.—On a bacterium pathogenic for Phylloxera and for certain Acarians, by M. L. Dubois.—On the determination of sex in hemp, by M. Mollard. From a fixed number of hemp seeds, an alteration of the conditions of growth may cause an alteration in the proportion of male and female plants produced.—Action of mineral salts upon the form and structure of the lupin, by M. Dassonville. The presence of dissolved salts, among other effects, increases the number and diameter of the vessels, and retards lignification in all the organs of the lupin.—On the composition of the oat, by M. Olivier de Rawton.—Composition of buck-wheat, by M. Balland.—On the use of calcium carbide against black rot, by M. G. Rodier.

NEW SOUTH WALES.

Linnean Society, September 29.—Dr. J. C. Cox, Vice-President, in the chair.—Revision of the Australian *Curculionidae* belonging to the subfamily *Cryptorhynchides*, Part i., by Arthur M. Lea. The subfamily *Cryptorhynchides* being in considerable confusion, it is proposed to examine and redescribe all the Australian genera and species referred to it. The genus *Poropterus* is treated of in the present communication, seventeen species being described as new.—On a new species of *Eucalyptus* from the Sydney district, by Henry Deane and J. H. Maiden. This is a tree of about thirty feet in height, with scaly bark and red timber. The seedling-leaves are ovate to ovate-lanceolate and always alternate. The veins and midribs are reddish and conspicuous. The transverse veins are numerous and fine, making an angle with the midrib of about 50°. The fruits are nearly hemispherical, with a slight tendency to constriction of the orifice, about four lines long by three lines deep, with a sunk rim. The anthers open by pores, showing the affinity of the species, in this direction, to *E. hemiphloia*, and the "Boxes." Its bark bears a superficial resemblance to that of *E. corymbosa*, and, because of its scaly nature, the name of *E. squamosa* is proposed for it.—Descriptions of some new Araneidae of New South Wales, No. 8, by W. J. Rainbow. Ten new species are described and figured, of which four are referable to the genus *Epeira*, three to *Argiope*, and one each to *Dicrostichus*, *Cheiracanthium*, and *Attus*. In addition to these, numerous specimens of architecture of spiders are described, and some figured, the families illustrated being the *Epeiridae*, *Drasidae*, *Attidae*, and *Thomisidae*.—Note on the genus *Aphritis*, Cuv. and Val., by J. Douglas Ogilby. The author contends that whereas five different fishes have been assigned to the genus *Aphritis*, C. and V., by various authors, these are referable to but three distinct species, each of which represents a monotypic genus; he distributes them as follows: *A. porosus* and *A. undulatus* lege *Eleginops maclovinus* (C. and V.), Gili; *A. urvillii* and *A. bassii* lege *Pseudaphritis urvillii* (C. and V.); *A. gobio*, Gath., differs greatly from *Pseudaphritis*, and must receive a new generic name. He concludes by suggesting that *Eleginops bursinus*, C. and V., is identical with *P. urvillii*, in which case our species would have to be called *Pseudaphritis bursinus*.—Notes on the species of *Cypræa* inhabiting the shores of Tasmania, by C. E. Beddome.

AMSTERDAM.

Royal Academy of Sciences, September 25.—Prof. van de Sande Bakhuyzen in the chair.—Mr. Hoek on the results of an inquiry, made by order of Government, into the practice of fishing with so-called "ankerkuilen" (large tow-nets not unlike

those employed in the Thames estuary for the whitebait-fishing), used in close time (April 1–June 15), in the mouth of the river, just below the limit of the farmed-out part, particularly with regard to our knowledge of the habits of the salmon, its migrations, &c.—Prof. Suringar presented a fifth contribution to the knowledge of the Melocacti, as a sequel to previous papers. The author showed the skeleton and a photograph of a specimen of *Melocactus humili* from Venezuela, described by himself in 1889, and seeds of which he sent at the time to the firm of Damman and Co., near Naples. It seems that the culture of this plant, which does not succeed in hothouses in North and Middle Europe, might be tried with advantage in the sunny climate of the South Italian coast, exposed to sea-winds. Prof. Suringar exhibited a live specimen, now seven years old, raised from the seed by the above firm, and which has already blossomed and borne fruit. With the exception of a slight difference in size and shape, the mother- and the daughter-plant are very similar. In the colony itself, too, the culture will be tried, that it may be possible to send culturable specimens over from there without detriment to the natural flora. The author exhibited photographs and gave a description of five new genera, received from Curaçao. The berries of these specimens, which have developed themselves on the plants in tolerably large numbers after the arrival of the latter, will be sent back to the colony, together with those of some known genera, received at the same time and determined in Amsterdam, to be sown there, so that the seedlings will at once go by their right names. In conclusion the author presented for inspection the first part of the Iconography announced some time back and published by the firm of E. J. Brill at Leyden, as the third volume of the "Musée Botanique" and entitled "Illustrations de Melocactus," with reproductions of photographs and coloured plates of the thorns, flowers and fruits.—Prof. Lorentz on the partial polarisation of the light emitted by a source in a magnetic field. The author showed how this phenomenon (discovered by Egoroff and Gorgiewsky) may be explained by taking into account the absorption which the rays of one part of the flame undergo in the other, this absorption being modified when the periods of the vibrations are changed by the Zeeman effect. In support of this view the author described an experiment in which the light of a sodium-flame which is placed outside the field, is found to be partially polarised after it has passed through a similar flame standing between the poles.—Prof. van der Waals on the graphic representation of equilibriums by means of the ζ -function. The author observed that at a given pressure and temperature, ζ has three values, and that consequently in general a surface is obtained, consisting of three sheets. Coexisting equilibriums exist if a common tangent plane to points either of the same sheet or of different sheets is possible. Increased pressure causes the heterogeneous region to decrease if the mixing is accompanied by contraction, and conversely. Similarly a rise of temperature causes the heterogeneous region to decrease if a supply of heat is required for the mixing, and conversely.—Prof. Behrens read a paper on mixture crystals of $KMnO_4$ with $KClO_4$ and of Ag_2CrO_4 with Ag_2SO_4 , which may serve to prove the presence of perchloric and chromic acid. That these crystals are not discoloured by saturated solutions of $KClO_4$ and of Ag_2SO_4 , must not be explained by assuming the crystals to be impenetrable, as enclosures are dissolved under similar circumstances.—Prof. Behrens also dealt with micro-reactions of free sulphuric acid; free ammonia and free alkalis. The first is owing to the formation of quinoneherapathite, the second to the formation of palladoammonium chloride. To detect KOH and NaOH together, the solubility of $PbCrO_4$ in caustic alkalis may be made use of; if they are to be separated at the same time, niobic acid hydrate is the best reagent. With KOH it yields a transparent solution, with NaOH colourless needles and rods. Antimonic acid hydrate too easily forms difficultly soluble salts with KOH.—Prof. Martin read a paper on the geology of the Moluccas, in connection with a work published by himself, supported by Government, and entitled "Keisen in den Molukken, in Ambon, den Uliassern, Seran (Ceram) und Buru, Geologischer Teil." A large portion of Ambon is of volcanic origin, and contains the continuation of the chain of volcanoes in Halmahera; Wawani in Ambon had an eruption as late as 1674. On the other hand, Wallace's opinion that Buru and the north-western part of Seran (Ceram) are volcanic, is incorrect. The author ascribed the eruptions in Halmahera, Ternate and Ambon to lateral displacements in the earth's crust, for in the most recent geological part terrific elevations took place; in Ambon, for

instance, the new reef chalks are situated as high as 480 m. above the sea-level. Volcanic eruptions and elevations are evidently intimately connected in those regions.—Prof. van der Waals presented on behalf of Dr. D. F. Tollenaar, for publication in the *Proceedings*, a paper on “Deflection and reflection with two kathodes.” The phenomena occurring when two kathodes are used, and which were described in a previous paper, may be explained in a simple way if the kathode rays are assumed to consist of negatively-charged particles, which are emitted with great velocity. Adopting Schuster’s formula for the potential fall in the proximity of a kathode, the course of such a particle, near a kathode, can be calculated. In this way the following results are arrived at: (1) behind the deflecting kathode the kathode rays cut each other, and so give rise to a surrounding sheet of light; (2) if the two kathodes emit their rays towards each other, then the rays of one kathode are partly so strongly deflected by those of the other as to be reflected to the emitting kathode; (3) with each of the two kathodes these reflected rays give rise to a second enclosing sheet of light and a corresponding deflection figure; (4) if the two kathodes are made to be of different intensity, the sheet of deflection formed by these reflected rays becomes larger towards the less intense kathode. This sheet of deflection, however, is not an ordinary Goldstein macro-surface, but might be called a pseudo macro-surface.

DIARY OF SOCIETIES.

THURSDAY, NOVEMBER 25.

ROYAL SOCIETY, at 4.30.—On the Geometrical Treatment of the “Normal Curve” of Statistics, with special reference to Correlation, and to the Theory of Error: W. F. Sheppard.—Mathematical Contributions to the Theory of Evolution. IV. On the Probable Errors of Frequency Constants, and on the Influence of Random Selection on Variation and Correlation: Prof. K. Pearson, F.R.S., and L. N. G. Filon.—On Certain Natural Media for the Cultivation of the Bacillus of Tubercle: Dr. A. Ransome, F.R.S.—Further Note on the Transplantation and Growth of Mammalian Ova within a Uterine Foster-mother: Walter Heape.—Further Observations upon the Comparative Physiology of the Suprarenal Capsules: Swale Vincent.—Summary of Prof. Edgeworth David’s Preliminary Report on the Boring at Funafuti: Prof. T. G. Bonney, F.R.S.—On the Determination of the Indices of Refraction of Various Substances for the Electric Ray. II. Index of Refraction of Glass: Prof. J. C. Bose.—On the Influence of the Thickness of Air-Space on Total Reflection of Electric Radiation: Prof. J. C. Bose.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Accumulator Traction on Rails and Ordinary Roads: L. Epstein. (Continuation of Discussion.)

CAMERA CLUB, at 8.15.—Photographic Action writ large: a Kurvey-linear Conversation on Corn: Prof. Armstrong, F.R.S.

LONDON INSTITUTION, at 6.—Acetylene: Prof. Vivian Lewes.

FRIDAY, NOVEMBER 26.

PHYSICAL SOCIETY, at 5.—Upon the Failure of German Silver and Platinoid Wires: Rollo Appleyard.

SATURDAY, NOVEMBER 27.

ESSEX FIELD CLUB (at Buckhurst Hill), at 7.—The Entomostraca of Epping Forest: D. J. Scurfield.—Report on Conference of Delegates of Corresponding Societies at Toronto: Prof. R. Meldola, F.R.S.

MONDAY, NOVEMBER 29.

SOCIETY OF ARTS, at 8.—Gutta-Percha: Dr. Eugene F. A. Obach.

IMPERIAL INSTITUTE, at 8.30.—Kafiristan: Sir George S. Robertson.

INSTITUTE OF ACTUARIES, at 5.30.—Address by the President.

TUESDAY, NOVEMBER 30.

ROYAL SOCIETY, at 4.—Anniversary Meeting.

ZOOLOGICAL SOCIETY, at 8.30.—On Regeneration of the Legs in the *Blattida*: H. H. Brindley.—On a Gigantic Sea-Perch (*Stereolepis gigas*): G. A. Boulenger, F.R.S.—Description of a New Tortoise of the Genus *Sternotherus*: G. A. Boulenger, F.R.S.—Remarks upon a Mountain Reedbed from the Eastern Transvaal: F. V. Kirby.

INSTITUTION OF CIVIL ENGINEERS, at 8.—On the Law of Condensation of Steam: Hugh L. Callendar, F.R.S., and John T. Nicolson.

WEDNESDAY, DECEMBER 1.

SOCIETY OF ARTS, at 8.—The American Bicycle—the Theory and Practice of its Making: Dr. Leonard Waldo.

GEOLOGICAL SOCIETY, at 8.—A Revindication of the Llanberis Unconformity: Rev. J. F. Blake.—The Geology of Lambay Island, Co. Dublin: C. I. Gardiner and S. H. Reynolds.

ENTOMOLOGICAL SOCIETY, at 8.

THURSDAY, DECEMBER 2.

LINNEAN SOCIETY, at 8.—On the Anatomy of *Candina coriacea*: Prof. Arthur Dendy.—On some Desmids from the United States: W. West and G. S. West.—Exhibitions: Specimens of Galls of *Cecidomyia*: Prof. J. B. Farmer.—An Egg of *Echidna*: Martin Woodward.

CHEMICAL SOCIETY, at 8.—Ballot for the Election of Fellows.—On Collie’s Space-Formula for Benzene: Dr. F. E. Matthews.

CAMERA CLUB, at 8.15.—Photomicrography: Dr. Spitta.

FRIDAY, DECEMBER 3.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Permanent Way: its Construction and Relaying: Grote Stirling.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

BOOKS.—Agricultural Chemistry: R. H. Adie and T. B. Wood, 2 vols. (K. Paul).—La Face de la Terre: Prof. E. Suess; traduit E. de Margerie, Tome 1 (Paris. Colin).—Leitfaden für Aquarien- und Terrarienfrennde: Dr. E. Zernecke (Berlin, Schmidt).—Die Moorbrücken im Thal der Sorge auf den Grenze Zwischen Westpreussen und Ostpreussen: H. Conwentz (Danzig, Bertling).—The Story of a Red Deer: Hon. J. W. Fortescue (Macmillan).—The Gallinaceous Game Birds of North America: D. G. Elliot (Suckling).—Practical Forestry: Prof. C. E. Curtis, 2nd edition (Lockwood).—The Hope Reports: edited by Prof. Poulton, Vol. 1 (Oxford).—Recherches Experimentales sur quelques Actinometres Electrochimiques: Dr. H. Rigollot (Paris, Masson).—Le Culture des Mers en Europe: G. Roché (Paris, Alcan).—Sixteenth Annual Report of the Bureau of American Ethnology (Washington).—The Foundations of Scientific Agriculture: Prof. S. Cooke (Longmans).—A Text-Book of General Botany: Dr. C. C. Curtis (Longmans).—With Nature and a Camera: R. Kearton (Cassell).—La Tuberculose et son traitement hygienique: P. Merklen (Paris, Alcan).—Pflanzenphysiologie: Dr. W. Pfeffer, Zweite Auflage i. Band (Leipzig, Engelmann).—Kollektivmasslehre: G. T. Fechner, herausgegeben von G. F. Lipps (Leipzig, Engelmann).—Tabeln und Tabellen zur Darstellung der Ergebnisse Spectroskopischer und Spectrophotometrischer Beobachtungen: Prof. T. W. Engelmann (Leipzig, Engelmann).—Observations on the Coloration of Insects: H. von Wattenyll, translated by E. J. Bles (Leipzig, Engelmann).—Beschreibung der Hauptmethoden welche bei der Bestimmung der Verbrennungswärme: W. Longuine (Berlin, Friedländer).—Elementary Drawing: E. M. Hallowell (Macmillan).—Zoological Record, 1896 (Turney).—First Book of Physical Geography: Prof. R. S. Tarr (Macmillan).—Compositions d’Analyse, Cinématique, Mécanique et Astronomie: Prof. E. Villié, troisième partie (Paris, Gauthier-Villars).—Laboratory Tables for Qualitative Analysis, 2nd edition (Manchester, J. E. Cornish).

PAMPHLETS.—Das Wachstum des Menschen: Dr. F. Daffnir (Leipzig, Engelmann).—Observations on a Collection of Papuan Crania: G. A. Dorsey (Chicago).—A Discussion of the Rainfall of South Africa during the Ten Years 1885–94: Dr. A. Buchan (Cape Town).

SERIALS.—Journal of the Franklin Institute, November (Philadelphia).—Science Progress, October (Scientific Press).—Journal of the Academy of Natural Sciences of Philadelphia, 2nd edition, Vol. xi. Part 1 (Philadelphia).—Bulletin de l’Académie Impériale des Sciences de St. Pétersbourg, 1896 October–December, 1897 April–June (St. Pétersbourg).—Chambers’s Journal, Christmas (Chambers).—Himmel und Erde, November (Berlin).

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