

tact, by MM. Stoletoff and Sokoloff.—On the influence of pressure on galvanic resistance, by M. Khwolson.—On dynamo-electric machines without iron, by M. Latchinoff.—On the voltaic arc, by M. Sloughinoff.

### SOCIETIES AND ACADEMIES

#### LONDON

**Royal Society, May 12.**—"Physiological Action of  $\beta$  Lutidine." By Greville Williams, F.R.S., and W. H. Waters, B.A. Up to the present the authors' investigations have chiefly related to the action of this poison upon the heart and central nervous system of the frog.

Various methods were used to study its effect upon the heart, and each gave most distinct results pointing to an increase of the tonicity. After the introduction of a small quantity of  $\beta$  lutidine into the system, stimulation of the vagus failed to cause a cessation of the heart's beat.

In frogs retaining their spinal cord the injection of the alkaloid removed all powers of reflex action, which removal the authors proved by other experiments to be due to the  $\beta$  lutidine acting on the reflex centre. The alkaloid was found to be antagonistic to strychnine: removing strychnine-tetanus when injected after that alkaloid and preventing its appearance when injected beforehand.

**Chemical Society, May 19.**—Prof. Roscoe, president, in the chair.—The following papers were read:—On ammonium nitrite and the reaction between hydrogen and nitric oxide in the presence of spongy platinum, by L. T. Wright. The author has repeated the experiments recently made by G. S. Johnson, who stated that the synthesis of ammonia was effected by passing hydrogen and nitrogen over heated spongy platinum. The author states that the nitrogen was contaminated with nitric oxide. The substance used by Johnson—ferrous sulphate solution—for freeing the nitrogen from nitric oxide does not completely absorb that gas. When pure nitrogen obtained by the action of potassium hypobromite on ammonium chloride, or by passing the nitrogen evolved by heating ammonium nitrite through an alkaline sulphite, was used no ammonia was formed. Hydrogen reacts upon nitric oxide in the presence of cold spongy platinum to form ammonia.—On the synthetical production of urea from benzol, ammonia, and air by the action of heated platinum, by E. F. Herroun. The author has aspirated air through benzol and ammonia, and then passed the mixed vapours over a heated spiral of platinum wire. Urea was formed, which was identified by its reactions and analysis. Acetylene can be substituted for benzol vapour.—On a proposed volumetric method for the ready estimation of a soluble sulphite and free sulphurous acid, or of free sulphurous and sulphuric acids even in the presence of sulphates, by O. V. Pisani.—On the identification of crystallised alkaloids by the microscope, and the use of polarised light, by A. Percy Smith.—On the colour-properties and colour-relations of the metals of the iron-copper group, by T. Bayley. The author continues in this paper his investigations as to the quantities of cobalt and nickel, or of cobalt, copper, and iron, which, when mixed as sulphates, produce colourless grey solutions.—On the effects of the growth of plants on the amount of matter removed from the soil by rain, by E. W. Prevost.—On the action of sodium on cinnamic ether, by F. Hatton.

**Physical Society, May 14.**—Prof. Fuller in the chair.—New Members: Mr. D. J. Blakely and Mr. Walter Kilner.—Prof. G. C. Foster read a communication from Prof. Rowland and Mr. E. H. Nichols of Baltimore, U.S., on electric absorption in crystals. According to the theory of Clausius, Maxwell, and others there should be no electric absorption in the case of perfectly homogeneous substances. Prof. Rowland tested this deduction in the case of glass, which is not quite homogeneous, quartz, and calcite. This was done by placing the material as the dielectric in a condenser formed of two amalgamated copper plates. The condenser was charged by six Leyden jars, and the absorption measured by a quadrant electrometer. The results were that quartz had about one-ninth the absorptive power of glass, and calcite none at all. Dr. Hopkinson said that the kind of glass was important, and threw doubts on the theory that the absorption was due to heterogeneity; paraffin wax had little absorptive power, and yet was very heterogeneous. Professors Perry and Ayrton thought that two non-homogeneous substances in combina-

tion might have no residual charge. Mr. Lewis Wright suggested that the optical character of crystals should be considered in these experiments, which might be extended to other crystals. Calcite is uniaxial.—Prof. Minchin, of Cooper's Hill, Engineering College, described his new absolute sine electrometer. This consists of two metal plates, in one of which is an aperture nearly closed by a metal trap-door suspended from the plate by two fine platinum wires, and resting against fine stops, when the plates are hung vertically. These plates are connected to the poles of the cell to be measured, and tilted out of the vertical till the attraction of the whole plate on the suspended trap or shutter is just balanced by the weight of the latter. The electromotive force is then proportional to the sine of the angle of displacement. Dr. Lodge remarked that the apparatus combined sensitiveness with practicability. The E.M.F. of a single cell could be measured by it, whereas Thomson's absolute electrometer could only give the total of a number of cells. Prof. Ayrton stated that he and Prof. Perry hoped to modify the instrument in the direction of sensitiveness by adding another plate and giving it a high charge. Dr. Coffin suggested reversing the process of taking an observation.—Prof. Foster read a paper by Dr. J. E. Mills, on the ascent of hollow glass balls through liquids. A glass ball of a pear shape rises through a liquid with a sensibly uniform velocity, which varies with the liquid. The time of ascent is proportional to the square of the diameter of the vessel, and depends of course on the specific gravity of the contents of the bulb. Dr. Mills measures the density of gases and liquids in this manner. Prof. Perry thought that the bulb should be of a shape having no re-entrant angles.

**Geological Society, May 11.**—R. Etheridge, F.R.S., president, in the chair.—Joseph Deeley, George Kilgour, Griqualand West, South Africa, and Roderick William MacLeod were elected Fellows of the Society.—The following communications were read:—Notes on the fish-remains of the bone-bed at Aust, near Bristol, with the description of some new genera and species, by James W. Davis, F.S.A., F.G.S. The fossil fishes described in this paper are from the Rhætic bed at Aust Passage. The fishes belong to the orders Plagiostomi and Ganoidei, some of the former being of considerable size. It is inferred, from the intermixture of Saurians and fishes, that the deposit is the result of shallow water existing near land, in which the fishes lived and the Saurians occasionally disported themselves. Besides the fossil remains of the animals which lived during the deposition of the Aust-beds, there are also others which appear to have been derived from the Mountain Limestone and the Coal-measures, representing such genera as *Psammodus*, *Psephodus*, *Helodus*, and *Ctenoptychius*.—On some fish-spines from the Coal-measures, by J. W. Davis, F.S.A., F.G.S.—The author described in this paper three species of a new genus of fossil fish from the Carboniferous formation, two of the species having been found in the Cannel coal of the West Riding of Yorkshire, and the other in the Burghlea limestone, near Edinburgh. *Anodontacanthus* is a straight spine, offering many points of resemblance to some of the Pleuracanthi; it has a similarly close-grained microscopical structure, the internal cavity opens terminally at the base of the spine, and it was not deeply implanted in the flesh of the fish. It however differs from all the Pleuracanthi in being quite free from external denticles; its surface is plain or but slightly striated, whilst that of *Pleuracanthus* always possesses a double row of denticles either ranged laterally along the exposed part of the spine or in some position between the lateral and posterior aspects of the spine. It is possible that evidence may be discovered which will render necessary the removal of these spines to the genus *Pleuracanthus*; but at present there is no evidence that such is advisable. All the specimens of *Pleuracanthus*-spine found associated with teeth or shagreen have been armed with the double row of denticles, and at present no evidence exists that spines without denticles were associated with remains of this genus. It is therefore considered best to institute a new genus for the three species with the name *Anodontacanthus*, in allusion to its having no teeth or denticles.—On some specimens of *Diasiopora* and *Stomatopora* from the Wenlock limestone, by Francis D. Longe, F.G.S. Mr. Longe showed and described some specimens of Bryozoa from the Wenlock limestone of Dudley, which he compared with corresponding forms from the Oolites and later periods, and pointed out the close similarity of the Silurian with the later forms, in respect of the shape and dimensions of the cells, as well as in the habit of cœnoecic growth.—On a new species of *Plesiosaurus*

(*P. Conybeari*) from the Lower Lias of Charmouth, with observations on *P. megacephalus*, Stutchbury, and *P. brachycephalus*, Owen, by Prof. W. J. Sollas, M.A., F.R.S.E., F.G.S., &c., Professor of Geology in University College, Bristol; accompanied by a supplement on the geological distribution of the genus *Plesiosaurus*, by G. F. Whidborne, M.A., F.G.S. The greater part of this paper was devoted to the description of a remarkably fine specimen of *Plesiosaurus* from the *Ammonites-obtusus* zone of the Lower Lias, Charmouth. For the species the name of *P. Conybeari* is proposed. *P. Conybeari* agrees closely with *P. Etheridgii* in the relative length of head and neck; but it has eight more cervical vertebrae than the last-mentioned species. In the number of the cervical vertebrae it agrees with *P. homalospondylus*, but has a much larger cervico-cephalic index.—On certain quartzite and sandstone fossiliferous pebbles in the drift in Warwickshire, and their probable identity with the true Lower Silurian pebbles, with similar fossils, in the Trias at Budleigh Salterton, Devonshire, by the Rev. P. B. Brodie, M.A., F.G.S.

**Institution of Civil Engineers, May 10.**—Mr. Brunlees, F.R.S.E., vice-president, in the chair.—The paper read was on torpedo boats and light yachts for high speed steam navigation, by Mr. John Isaac Thornycroft, M.Inst. C.E.

**Meteorological Society, May 18.**—Mr. G. J. Symons, F.R.S., president, in the chair.—D. W. Barker, B. Jumeaux, W. Oelrichs, H. Porter, W. Roper, and Rev. G. R. Wynne were elected Fellows of the Society.—The following papers were read:—Comparison of Robinson's and Osler's anemometers, with remarks on anemometry in general, by Richard H. Curtis. The author in this paper gives a very clear statement of the present state of anemometry, and points out the defects in Osler's and Robinson's anemometers, which are the chief forms of recording instruments used in this country.—Notes on waterspouts observed at Cannes in January or February, 1872, by the Hon. F. A. Rollo Russell, M.A.—On some Swedish meteorological observations in connection with the return of the seasons, by Alexander Beazeley, M.Inst.C.E.

PARIS

**Academy of Sciences, May 16.**—M. Wurtz in the chair.—The following papers were read:—Meridian observations of small planets at the observatories of Greenwich and Paris during the first quarter of 1881, communicated by M. Mouchez.—Nebulae discovered and observed at the Observatory of Marseilles, by M. Stephan.—On the supposed presence of Proteaceae of Australia in the flora of ancient Europe, by M. de Saporta. He gives reasons for doubting the supposed relation of the fossil plants, and the anomalous direct implantation in the heart of ancient Europe of a whole colony of plants that are now confined to a region in the southern hemisphere.—M. Berthelot presented the second edition of his "Traité élémentaire de Chimie organique" (which is about double the first).—Report on a memoir of M. Graeff relative to a series of experiments at the Furens reservoir on outflow of water.—On the transformation of morphine into codeine and homologous bases, by M. Gremaux. Codeine he regards as a methyl ether of morphine, considered as phenol. He transforms morphine into codeine by heating it with alcoholic potash or soda and iodide of methyl. Using ethylic iodide, a new base is got, homologous with codeine; indeed a series of these *codeines* (as the author calls them) may be had, as numerous as the series of ethers of an alcohol.—On the most ancient reptiles found in France, by M. Gaudry. He presented a fine specimen of remains of *Steeorachis dominans*. By their enlarged ribs, the arrangement of the thorax, the scales with spines, and especially the characters of the humerus, the Permian reptiles of France (like some fossils of South Africa, studied by Prof. Owen), somewhat lessen the wide interval between reptiles and monotrematous mammalia. They have traits of resemblance to reptiles of the Trias, and to those of the Permian in the United States, studied by Mr. Cope.—Observations on Swift's comet at Marseilles Observatory, by M. Borrelly.—On the separation of roots of numerical equations, by M. Laguerre.—On the principle of conservation of electricity, by M. Lippmann. The principle is expressed by a condition of integrability. In the memoir the author's method of analysis is applied to various phenomena—dilatation of glass of a Leyden jar during charge, electrification by compression of hemihedral crystals, and pyroelectricity of crystals. The existence and law of certain new phenomena, not yet verified, are deduced.—On a mode of graphic representation of phenomena produced in

dynamo-electric machines, by M. Deprez. A curve, called the characteristic of the machine, is got thus: Communication being first broken between the ring and the exciting electro-magnets, a known current, from an external source, is sent through the latter. The ring is then rotated with a given velocity; then the difference of potential between the two extremities of the (broken) induced circuit is measured. The auxiliary current is varied, and its intensities are taken as abscissæ; the ordinates are the differences of potential of the ends of the induced circuit.—On the theory of rotatory polarisation, by M. Mallard.—On the hydrates formed by chloride of calcium, by M. Lescœur. He recognises the existence of CaClHO, of CaCl<sub>2</sub>HO, of CaCl<sub>4</sub>HO (only under 129°), and of CaCl<sub>6</sub>HO (under 65°).—On the solubility of mercurous chloride in hydrochloric acid, by MM. Ruysen and Varenne.—Peptones and alkaloids, by M. Tanret.—On the non-existence of *Microzoma creta*, by MM. Chamberland and Roux. The Meudon chalk behaves like chalk sterilised by heating, and contains nothing capable of producing microscopic organisms or any fermentation; thus M. Béchamp's observations (1866) are controverted.—On the crystallisation of alums, by M. Loir. The different faces of a crystal have not the same attractive power towards the solution of the substance employed to feed it.—Phyllotaxy, by M. Baron.—Studies on the coal formation of Commeny, by M. Fazol. He supposes that all the materials of this formation have been carried by water and deposited in a deep lake during a tranquil geological period.—On the milch sheep, by M. Tayon. There is an inverse correlation between the production of wool and that of milk. The presence of hairs directed upwards on the teats and neighbouring parts is noticed.—On the alterations of milk in sucking bottles, ascertained along with the presence of a cryptogamic vegetation in the caoutchouc tube fitted to the glass bottles, by M. Fauvel. Of thirty-one sucking-bottles examined in the crèches, twenty-eight contained this cryptogamic vegetation.

VIENNA

**Imperial Academy of Sciences, May 19.**—V. Burg in the chair.—Dr. W. Biedermann, contributions to general nerve and muscle physiology (part vii.): on the chemical changes during polar excitation by electric currents.—Dr. E. Weiss, supplement to his communication of May 12 on the Swift comet.—Prof. L. V. v. Zepharovich, crystallographical-optic examinations into the camphor-derivatives.—Dr. Hans Molisch, on the deposits of carbonate of lime in the stems of dicotyledonous wood.—Dr. F. Lippich, contributions to the theory of the Polyhedra.—G. Czetzczka, researches into yeast.—T. Haubner, on the magnetic behaviour of iron powders of different density.

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