SOCIETIES AND ACADEMIES

LONDON

Physical Society, June 26.—Prof. W. E. Ayrton, F.R.S., Vice-President, in the chair.—Mr. E. M. Langley was elected a Member of the Society.—The following communications were read:—On certain sources of error in connection with experiments on torsional vibrations, by Mr. Herbert Tomlinson. During a long series of researches on the torsional elasticity and internal friction of metals, the author has come across the following sources of error in connection with torsional vibrations. In some of the earlier experiments a horizontal brass bar was suspended by a wire and oscillated, the times of oscillation being observed by the ordinary lamp, mirror, and scale. The moment of inertia was varied by sliding two brass cylinders, suspended from the bar by fine wires, backwards and forwards along it. It was then found that under certain conditions the bar executed a few vibrations of rapidly decreasing amplitude, came to rest, and then commenced to swing again, the amplitude increasing to a maximum, again decreasing, and so on. This effect was finally traced to an approach to synchronism between the time of oscillation of the bar and that of the small cylinders about their axes of suspension, the absorption of energy being due to these being set in vibration. The effect entirely disappeared upon clamping the cylinders rapidly to the bar. On another occasion, however, the old phenomenon reappeared, and after much time spent in investigating it, was found to be due to a somewhat similar cause, a near approach to synchronism between the periods of torsional and pendulous vibrations. If the axis of the wire passed accurately through the centre of mass of the vibrator, this would not occur; and this condition it is practically impossible to fulfil. Another source of error lies in the fact that, in a wire recently suspended, the torsional vibration-period will always be found to be slightly greater than when it has been suspended for some time and frequently oscillated.—On a mode of driving electric tuning-forks, by Prof. S. P. Thompson. It is invariably found that the frequency of an electrically maintained fork is continually changing. This great inconvenience the author believes to be due to the fact that the impulses are given to the prongs at a disadvantageous moment, namely, when they are at the extremities of their swings. It is desirable that the impulse should be given at the middle of the swing, and to effect this it is suggested that each fork should make and break the circuit of the magnet influencing the other one, and it was shown how the electrical connections could be made to effect this in a simple manner.—Prof. Silvanus P. Thompson then read some further notes on the formulæ of the electro-magnet and of the dynamo. The author pointed out that a misapprehension of his former paper on this subject had given rise to certain critical remarks by Dr. O. Fröhlich, to which he replied. The author also explained the new form given recently by Dr. Fröhlich to the formula of the electro-magnet, rendering it much more readily applicable to the various equations of dynamo-machines. Formerly the Lamont-Fröhlich formula had been written—

$$m = M \frac{kx}{1 + kx},$$

where M and k are constants, and x the magnetising force. Dr. Fröhlich now suggested a formula of the form—

$$m = Y \frac{x}{x + x'},$$

where Y is the maximum value of m, and where x is either the current or the potential applied to the electro-magnet, and x' the diacritical value of the same; the "diacritical" value, as defined by the author in 1884, being that value which produced the state of half-saturation of the magnetic circuit. The author, folowing the lines laid down by Fröhlich in the use of this equation, showed that the general equation of the self-exciting dynamo is necessarily of the form

$$\psi = \Psi - \psi',$$

where ψ is either current or potential, ψ' the "diacritical" value of the same, and Ψ the "maximal" value of the same; that is to say, is the value which ψ would have if the given machine were run at the given speed and with the given internal and external resistances, but having its magnets independently excited to absolute saturation. Further deductions concerning the "dead turns" of the dynamo, their independence of speed, and dependence upon the resistances of the circuit and upon the construction of the machine were shown.

SYDNEY

Linnean Society of New South Wales, April 28.—Prof. W. J. Stephens, F.G.S., President, in the chair.—The following papers were read:—On some Lepidoptera from the Fly River, New Guinea, by E. Meyrick. Mr. Meyrick's paper contains an account of the Lepidoptera (Heterocera), collected by the recent New Guinea Expedition. Specimens of twenty-five species were met with, of which fifteen appear to be new, and are described by Mr. Meyrick. Nearly all of these may be said to be of normal Indo-Malayan types. A few specimens, from their bad condition, were unidentifiable or unfit for description.—Catalogue of the described Coleoptera of Australia, part 4, by George Masters. This part contains the names of, and references to, all the known species of the families—*Trixagidæ*, *Eucnemidæ*, *Elateridæ*, *Cebrionidæ*, *Rhipidoceridæ*, *Dascillidæ*, *Malacodermidæ*, *Cleridæ*, *Lymexylonidæ*, *Cupesidæ*, *Ptinidæ*, *Cividæ*, *Bostrychidæ*, *Tenebrionidæ*, *Cistelidæ*, *Pythidæ*, *Monommatidæ*, *Melandryidæ*, *Lagriidæ*, *Pedilidæ*, *Anthicidæ*, *Pyrochroidæ*, *Mordellidæ*, *Rhipidophoridæ*, *Cantharidæ*, and *Œdemeridæ*, numbering 1494 species.—Miscellanea Entomologica, by William Macleay, F.L.S. This is the first of a series of papers descriptive of some of the new or rare Coleoptera in the Macleay Museum. The intention of the author is to accompany these descriptions with a general review of the genera or groups dealt with. The present paper is a revision of the genus *Diphucephala*, to which over twenty new species are added.—A revision of the Staphylinidæ of Australia, part 1, by A. Sidney Olliff, Assistant Zoologist, Australian Museum. The object of this paper is to furnish entomologists with descriptions of all the Australian Staphylinidæ at present known, to summarise the characters of the genera, and to make known a number of new forms. This first part contains the sub-family Aleocharinæ, of which the tribes Aleocharina, Gyrophænina, and Gymnusina are all represented. Among the most remarkable of the new forms belonging to the first of these tribes is a species from New South Wales described under the name *Apphiana veris* (gen. et sp. nov.), and characterised by having the basal joints of the antennæ enormously dilated on the outer side; the second joint being twice as broad as long, the third equally broad, but shorter, the fourth, fifth, and sixth shorter and gradually decreasing in breadth. In *facies* the species resembles a *Pelioptera*.—Notes from the Australian Museum, by E. P. Ramsay, F.R.S.E., and J. Douglas Ogilby. Two species of fish are described in this paper—*Myripristis carneus*, from the Admiralty Islands, presented to the Australian Museum by Capt. Farrell, and *Sygnathus parviceps*, from the Clarence River district, presented by Mr. Temperly, Inspector of Fisheries.—The Hon. James Norton exhibited a number of fossils (Chætetes and Spirifers) from Black Head, a few miles south of Kiama. Also, specimens of a porphyritic rock from Coolangatta, Shoalhaven, with the large crystals present in some, and decomposed by weathering in others.—Mr. Whitelegge exhibited specimens of a large species of *Nitella* with the following explanatory note. "A short time ago I found in the Parramatta River a very remarkable member of the above genus. It is an erect growing plant between 3 and 4 feet in height, mostly branching near the base, and giving off some five or six whorls of simple leaves, each leaf consisting usually of three cells, sometime of only two. The stem and leaves (six in number) are usually about $\frac{1}{16}$ of an inch in diameter. The internodal cells of the stem are usually 4 or 5 inches, but sometimes much longer. I have measured some of the largest yet found, and they are from 7 inches up to 8½ long. It is highly probable that the cells of this plant are larger than those of any hitherto recorded. There are several other features which may not have been noticed in the genus. For instance, the leaves can be readily disarticulated from the stems without any apparent injury to either. When a cell is ruptured the sound produced is not unlike that of the bursting of the air-bladders of seaweeds. The rotation exhibited in the inner nodal cells differs from that of the stem and leaves, inasmuch as the chlorophyll granules take part in the general rotation. The protoplasm in the young leaves, when viewed under the microscope with the edge of the cell in focus, appears as a series of elevations and depressions, and with the higher part of the cell in focus, these elevations appear as clear spaces surrounded by small granules. Within the layer of protoplasm there exist large numbers of spherical clusters of needle-like

crystals, which circulate along the line of demarcation between the cell-sap and the protoplasm."

PARIS

Academy of Sciences, July 12.—M. Jurien de la Gravière, President, in the chair.—On the relations that exist between the geodetic and geological sciences, by M. Faye. The author's remarks are intended to show that the distinction formerly drawn between these two sciences can no longer be maintained. Thus in geodesy, for example, the sum of the forces acting on the terrestrial globe cannot be considered apart from those incessantly modifying its relief. The recent objection regarding the Quaternary glaciers is specially dealt with, not from the geological standpoint, but from that of the attraction exercised by them on the seas.—Note on the navigation of the Suez Canal at night, by M. de Lesseps. The question of nocturnal navigation, which would practically double the capacity of the canal, has now been studied exhaustively, and successfully solved by the adoption of signal lights along the route and electric lights on board the vessels in transit.—Experiments on waves, and especially on the diminution of the mean lateral pressures of undulations in canals, by M. A. de Caligny. A series of experiments are reported made on a miniature artificial canal, with the view of testing the various actions of translation and side pressure of the waves on floating bodies.—Reflections on the critical remarks of M. Hugoniot, which appeared in the *Comptes rendus* of June 28, by M. Hirn. The reference is to the author's last experiments on the flow of gases, some of whose conclusions are here sustained against M. Hirn's objections.—Identity of origin of the fluorescence $Z\beta$ by reversion, and of the bands obtained by Mr. Crookes in vacuum, by M. Lecoq de Boisbaudran. It is shown that the red band 619 of Mr. Crookes's former spectrum of yttria is due to the same earth as the author's band $Z\beta$ obtained by reversion, and that this band does not consequently characterise a new element.—Observations made during the cholera epidemic of 1885, by M. A. Guérard.—This work, by the engineer-in-chief of the Marseilles harbour works, traces the progress of the epidemic during the years 1884-85, and attributes its virulence primarily to the contaminated waters of the little River Huveaune used for domestic purposes in the districts which suffered most.—Observations of the new planet 259 and of the comet Brooks III., made at the Observatory of Nice (Gautier equatorial), by M. Charlois.—Solar observations during the first six months of the year 1886, by M. Tacchini. These observations show a progressive diminution of the phenomenon of solar spots, as well as of the solar protuberances.—On the Peruvian metrical standard, by M. Foerster. Admitting the authenticity of this standard, the author asks that accurate determinations be made of the value in metres of its two lengths, in order that all geodetic measurements, old and recent, be reduced to the same unity, that is, the international metre. In some subsequent remarks the same course was urged by M. Wolf.—Note on M. G. A. Hirn's experiments on the discharge of gases through orifices, by M. Parenty.—A new method of constructing the screw, by M. Trouvé. During the course of protracted experiments on the application of electricity to the propulsion of ships, the author has been led to study the various forms of screw now in use, and to devise another, here described, of far more simple structure.—On a physiological condition influencing photometric measurements, by M. Aug. Charpentier.—On the heat of formation of selenhydric acid, by M. Ch. Fabre. The three methods here described for measuring this heat of formation yield a mean of −9·44 cal. for gaseous selenhydric acid.—On a new species of asparagine, by M. A. Piutti. This new substance, recently discovered by the author while assisting at the preparation of asparagine in M. G. Parenti's laboratory, at Sienna, has a rotatory power, as determined by Laurent's great polarimeter, equal to, and with contrary sign to that of ordinary asparagine. The paper elicited some remarks by M. Pasteur on the great difference in taste of the two varieties of asparagine.—Distribution of a base between two acids; special case of the alkaline chromates, by M. P. Sabatier.—On the titanates of crystallised baryta and strontian, by M. L. Bourgeois. This paper is devoted to a study of the crystallised earthy alkaline titanates, which are obtained by the application of the known method—fusion of the elements of the salt in the corresponding chloride.—Action of chlorine on the seleniocyanate of potassium, by M. A. Verneuil. From the experiments here described, it appears that the action of chlorine on the alkaline seleniocyanates differs greatly from that which it exercises on the corresponding sulphocyanates. Bromine and iodine give rise to analogous phenomena.—Transformation of glucose to dextrine, by MM. E. Grimaux and L. Lefèvre. The transformation here effected for the first time is shown to throw some light on the somewhat obscure history of the dextrines.—On the transformation of the amides to amines, by M. H. Baubigny.—Isomery of the camphols and camphors; camphol of valerian, by M. Alb. Haller. A comparison of the properties of this camphol and its derivatives with those of the camphol of N'gai and its corresponding derivatives shows complete identity between these two products. In a further communication the author hopes to show that these two camphols themselves are also identical with that derived from the spirit of madder.—Electrolysis of an ammoniacal solution with the electrodes of carbon, by M. A. Millot.—On an alcoholate of crystallised potassa, by M. Engel. The body here determined, and named "alcoholate of potassa," has the formula—

$$KOH + 2(C_2H_6O).$$

—On propionic acid, by M. Ad. Renard.—Researches on the development of beetroot (continued); general conclusion; by M. Aimé Girard.—The law of connections applied to the morphology of the organs of the Mollusks, and especially of Ampullaria, by M. E. L. Bouvier.—On the presence of Ricins (Mallophages) in the quills of birds' feathers, by M. Trouessart.—On the absorption of carbonic acid by leaves, by MM. Dehérain and Maquenne. From the experiments here described it is shown (1) that the proportion of pure carbonic acid absorbed under atmospheric pressure varies with the quantity of water contained in the leaves; (2) that the coefficient of absorption of this acid by the water contained in the leaves is in the normal temperature superior to the coefficient of solubility of the same gas in water; (3) that the absorption is extremely rapid, which explains how the foliage is able to extract the extremely minute quantities of carbonic acid (some ten-thousandths) contained in the normal atmosphere.—On the crystallographic association of the triclinic felspars, by M. R. Bréon.—On the "ophite" eruptive rocks of Corbières, by M. Viguier.—Note on the primitive and Cambrian micaceous schists of Southern Andalusia, by MM. Ch. Barrois and Alb. Offret.—On injections of toxic gaseous medicines through the rectum; successful treatment of pulmonary affections by this means, by M. L. Bergeon.

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