

on Brazilian topaz. The author refers the phenomena to the presence of a single electric axis, inclined to each of the three principal axes of the crystal. He also points out that the two optic axes do not make equal angles with the greatest of the three principal axes.—W. Stscheglaieff, on the electro-magnetic rotation of the plane of polarisation in chloride of iron. Curves given show that in this substance Verdet's rule that the rotation is proportional to the intensity of the field is not observed.—H. Haga, experimental researches on the convection of heat by the electric current. Careful experiments described in this paper show that the Thomson effect in mercury is negative.—Fr. Stenger, on phenomena of fluorescence. Some doubt having been thrown upon the transmutation, by Magdala red and other bodies, of red rays into orange or yellow rays, the appearance of these higher rays being attributed to stray light, the whole matter has been repeated with the utmost precautions. It appears to be now established that eosin and fluorescein also have this property. All three bodies are exceptions to Stokes's rule that the transmutation in fluorescence is always a degradation in the spectrum scale. The author also discusses the matter in relation to Lommel's theory and to the influence of solvents.—E. Ketteler, a remarkable limiting case of crystalline reflection, and its investigation by the aid of the perfected total-reflectometer of Kohlrausch.—G. Hansemann, on a new method of determination of periods of oscillation of bar-magnets. A photographic camera and a mirror oscillating in conjunction with a seconds pendulum are applied to the ordinary apparatus for observing oscillations by reflection.—Werner Siemens, on the conservation of energy in the atmosphere of the earth. A discussion of atmospheric laws and of *vis viva* of the atmospheric masses, too involved for a brief abstract.—R. Gerhardt, on the tube-flute stop of the organ. An experimental and mathematical discussion of the effect of putting a small open tube into the closed top of the flute pipe.—W. Alexejew, on solutions. The author arrives at the following conclusions: solids dissolve better than liquids; at one given temperature a solid can give only one saturated solution, a liquid two; supersaturated solutions have two temperatures of decomposition, one at which decomposition may occur, another at which decomposition must occur. A large number of data of observation are plotted in curves.—E. Himstedt, reply to the observations of Lord Rayleigh upon my determination of the ohm.—L. Graetz, on the dependence of the elasticity of caoutchouc upon temperature, and its relation to coefficients of thermal expansion. From his observations the author predicts that a twisted rod of caoutchouc, when suddenly further twisted, will warm itself.—Fr. Stenger, simple demonstration of residual electric charges, by means of an exhausted tube used as a Leyden jar.—A. Oberbeck, remarks on my work on the resonance of electric oscillations. An acknowledgment of the priority of Dr. J. Hopkinson.—A. König, on an observation respecting the empirical basis of our perception of space. This basis is the apparent extent of the objects in the field of vision as distributed over the retina, and their relative apparent displacement when the eye is turned about.—Fr. Stenger, correction to the memoir on the properties of calc-spar in a homogeneous magnetic field.

Rivista Scientifico-Industriale, June 30.—On some new registering thermic instruments, by Prof. Filippo Artimini. A full description, with illustrations, is given of the author's registering thermo-pyrometer, in which the degrees of temperature are accurately recorded by an ingenious application of electricity.—Telephoning at great distances, by F. van Rysselberghe. The author gives a summary of his recent experiments in the United States, showing the possibility of telephoning at any distance and establishing a regular international telephonic service between all the great cities of the world. The telegraphic wires now in use may be utilised for the simultaneous transmission of telegraphic and telephonic messages.

SOCIETIES AND ACADEMIES

SYDNEY

Royal Society of New South Wales, June 2.—Chr. Rolleston, C.M.G., President, in the chair.—Papers read:—A new species of *Ardisia* from New Guinea, by Baron Ferd. von Mueller, K.C.M.G., F.R.S., descriptive of the only specimen as yet found so far north.—A comparison of the dialects of East and West Polynesia, Malay, Malagasy, and Australian, by the Rev. George Pratt, author of a dictionary of the Samoan lan-

guage. This was a valuable contribution towards a polyglot of the languages of Polynesia, some of which have already passed away, and most of which are changing through the introduction of new words and the rapid intermingling of various races. The Royal Society of New South Wales was urged to take steps to preserve these records and customs not only of Polynesia, but of the fast-diminishing tribes of Australia.—The discovery of a poison in three species of *Daphnandra*, a genus of plants of the order Monimiaceae, by T. L. Bancroft, M.B. (Edin.), F.L.S. (Brisbane).—On some new poisonous substances discovered on the Johnstone River, North Queensland, also by Dr. Bancroft. These papers were descriptive of experiments of the therapeutic action on the guinea-pig.—Prof. Liversidge, F.R.S., exhibited and described: (1) a meteorite, the third one known to be found in New South Wales, composed of iron principally, nickel, cobalt, sulphur, phosphorus, and carbon; (2) the matrix of the rock of the tin deposits of Tasmania, in which the cementing material is topaz; (3) a collection of New South Wales silver ores (38 specimens), collected by Mr. McGarvie Smith; (4) shale from the Hawkesbury sandstone showing worm tracks and perforations, the first time noticed in these rocks.—Mr. Lawrence Hargrave exhibited a model illustrating the undulatory motion of serpents, based upon the trichoidal plane, a continuation of similar studies by him on the motion of fishes and the flight of birds.

Microscopical Section.—The following papers were read during the year 1885:—The *Phylloxera vastatrix*, by Dr. Morris, illustrated with specimens of the diseased vine from the neighbourhood of Sydney; and by the same author, Notes on mounting diatoms in highly refractive media.—Specimens of *A. pellucida* were exhibited mounted in piperine, picric acid, chlorides of tin, and thallium, and sulphur in combination with disulphide of arsenic. These slides were exhaustively tested against the American methods, viz. Dr. Chase's metallic silver and realgar, also Prof. Smith's (Geneva, N.Y.) specimen slide. The microscopes and accessories were of the latest make, and the objectives used were homogeneous immersions by Tolles, 1/10, 1/25; Spencer, 1/12; Powell, 1/12, 1/20. The slides of Dr. Morris's sulphur and arsenic combination gave the best results. In addition to the above-mentioned objectives the following choice glasses were acquired by members of the section during the year:—Powell's, 1/6; Hom N.A., 1/5; Green (late Tolles), 1/2" 30°; Bausch and Lomb's, 1/16 immersion; Wales, 1/12 immersion, 170°. A valuable Ross Zentmeyer binocular stand with apparatus was presented by H. G. Wright, M.R.C.S.E., whilst immersion and high-angled condensers were purchased. Amongst the numerous slides exhibited were some of new mosses found in the neighbourhood of Sydney by Mr. Whitelegge, and a bacillus found by Dr. Morris in the ulcerated intestine of a foal, the cause evidently of a widely spread epidemic prevalent throughout the colony amongst young foals only.

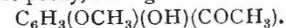
PARIS

Academy of Sciences, August 2.—M. Jurien de la Gravière, President, in the chair.—On the relations of geodesy to geology, by M. H. Faye. In this second communication it is shown that the harmony of the two sciences results in the remarkable law determining the constancy of the mathematical figure of the globe throughout the whole series of geological evolutions, a law which sooner or later will enable us to form a clear idea regarding the thickness of the present crust of the earth. At the same time the problem cannot be completely solved by the resources of geometry alone, and recourse must be had to the other sciences bearing on the subject.—On the displacement of ammonia by other bases, and on its quantitative analysis in the soil, by MM. Berthelot and André. From their further researches the authors conclude that ammonia cannot be safely employed for the quantitative analysis of ammonia in the analysis of the earths and other organic products containing insoluble double ammoniacal salts. Certain derivatives from the aldehydes are in the same position, as are also probably the ammoniacal salts formed by the humic and allied acids.—On the quantitative analysis of ammonia (continued), by M. Th. Schloësing. Having previously shown (July 26) that by distillation on magnesia all the ammonia may be extracted from the solution of its hydrochlorate, or from that of the ammoniaco-magnesian phosphate, the author completes his demonstration by causing the magnesia to act on the double ammoniacal salts, and especially on the chlorides containing magnesium and zinc.—Observations on the oldest sedimentary groups in the north-west of France (continued), by M. Hébert. A careful study of the whole region.

leads to the conclusion that North Brittany, north of a line drawn from Quimper to Rennes, and West Normandy, north of a line drawn from Pontorson to Domfront and Falaise, are mainly constituted by the vertical clay-slates of Saint-Lô, overlain by the purple conglomerates, schists, and nearly horizontal red sandstones. This is confirmed the general conclusion announced by Dufrenoy in 1835.—On the presence of microscopic mineral crystals of the feldspar group in certain Jurassic limestones of the Alps, by M. Ch. Lory. The crystals here described yield on analysis about 47 per cent. of potassic and sodic feldspar mixed with a little albite; 45 of quartz in bipyramidal crystals and pulverised; 8 of argile, analogous in its composition to that of the carbonates of lime of the same horizon.—On the operations prosecuted in Tunisia by Commander Landas since the death of Col. Roudaire, by M. de Lesseps. The creation of an inland sea, the original object of these works, has been definitively abandoned, and attention is now devoted to the Wed Melah basin, which, by the sinking of Artesian wells, promises soon to recover its former productiveness.—Note on M. Marcel Deprez's experiments relating to the transmission of force between Creil and Paris, by M. Maurice Lévy. In this note is embodied the report of the sub-committee appointed to verify the results already obtained by M. Deprez during the course of the experiments carried out by him at Creil since November 1885. The main object of these experiments was to show the possibility of transmitting electrically to the Paris terminus, a distance of 56 kilometres, a force of 200 horse-power generated at Creil on the Great Northern line, with an effective yield of 50 per cent. The preliminary operations, concluded on May 24, show that the force consumed at Creil varied from 67 to 116 horse-power, that received at Paris from 27 to 52 horse-power, the yield being from about 41 to 45 per cent., and increasing with the transmitted force. The experiments, conducted at the expense of MM. Rothschild, show conclusively that with a single generator and a single receiver force may be profitably transmitted to a distance of over thirty miles with a loss of not more than 55 per cent. on 52 horse-power, without exceeding a current of 10 amperes, an angular velocity of 216 revolutions per minute, or a peripheric velocity of 7.50 m. per second. With improved appliances the loss, mainly due to absorption by the machines themselves, will probably be reduced to 50 per cent., and to still less in operations conducted on a larger scale.—Measurement of the intensity of sound by means of the manometric flames, by M. E. Doumer. It is shown that this apparatus, hitherto used mainly as a method of demonstration and summary study of the *timbre* of vocal sounds, is susceptible of far more varied applications, and especially may rival the graphic method in determining the height or intensity of sound.—On the separation of arsenic, antimony, and tin, by M. Ad. Carnot. By employing oxalic acid and the hyposulphite of soda or ammonia, sulphurous acid and sulphuretted hydrogen, the author has succeeded in effecting these separations rapidly and accurately, as he had already effected the separation of copper, cadmium, zinc, and nickel. His new methods enable him greatly to simplify the analysis of the complex alloys, of which these metals are constituents.—Heat of formation of the crystallised seleniures and of the amorphous seleniures, by M. Charles Fabre. Here are treated the seleniures of iron, manganese, cobalt, nickel, zinc, cadmium, copper, thallium, lead, mercury, and silver. In general the heat of formation of the seleniures prepared at high temperatures is shown to be equal or slightly inferior to that of the corresponding precipitated sulphides.—On the combinations of chloral and of resorcine, by M. H. Causse.—On the composition of the element in the grease of sheep's wool which is soluble in water, by M. E. Maumené.—On the indirect innervation of the skin, by M. C. Vanlair.—Note on the arterial system of the scorpion, by M. F. Houssay.—Fresh researches on the production of monstrosities in the hen's egg by a modification of the germ before incubation, by M. Dareste.—Observations on the pollinisation of orchids indigenous in France, by M. Paul Maury.—A first survey of the vegetation in the French territory of the Congo, by M. Ed. Bureau. The botanical collections formed by the Mission of West Africa, which have already reached Paris, comprise two herbariums, one collected by MM. Thollon and Schwébisich, the other by MM. J. de Brazza and Pecile. There are altogether 599 species, chiefly from the districts of Franceville, Brazzaville, Ossika, Diélé, Lékéti, and Nganshu, on the Ogoway, Alima, and Lower Congo.

BERLIN

Chemical Society, May 24.—Dr. W. Will reported on the utilisation of myristic acid for lauric acid. According to the investigations of C. Reimer and W. Will there was, in the nuts of *Myristica surinamensis*, an excellent material for obtaining large quantities of myristic acid. Herr Lutz, student, had obtained from it myristinamid, and in accordance with the method of Hofmann, had transferred that into myristintriacylurea, triacyclamin, triacycl nitride, triacyclamid, and the corresponding combinations of the twelfth series, inclusive of lauric acid.—Herr O. N. Witt reported on experiments for the local determination of the sulfo group in the naphthalic acids, which led him to the same results as those obtained by Clève.—Prof. C. Liebermann referred to a work undertaken but not yet completed, with a view to the elucidation of the constitution of opianic acid. He showed that there were reasons to support the assumption of an aldehyde group in this compound, as also for the opposite assumption, a fact which led to a discussion on the so-called atom migrations, in which Herren Hofmann, Klason, Liebermann, Krämer, Pinner, and Will took part. Prof. Hofmann then called attention to the fact that such molecular shiftings of place had been particularly in quite recent times observed by him whilst studying the ether of cyanuric acid. He described the formation of a 2/3 isother and 1/3 ortho-ethyl ether of cyanuric acid which he had obtained from cyanurate of silver by means of ethyliodide. This ether transformed itself, even at the ordinary temperature, into isother-ethyl-cyanurate.—In conclusion Prof. Tiemann communicated a work by N. Nagai, on an aromatic ketone isolated from the root of a Japanese peony, having the constitution—



BOOKS AND PAMPHLETS RECEIVED

"Madagascar," by Prof. R. Hartman (Freitag, Leipzig).—"Elements of the Comparative Anatomy of Vertebrates," by K. Wiedersheim; translated by W. N. Parker (Macmillan).—"Bulletin de la Société Impériale des Naturalistes de Moscou," No. 1, 1886 (Moscou).—"Publications of the Leander McCormick Observatory, Virginia," vol. i. part 2.—"Algebra," part 1, by G. Chrystal (Black, Edinburgh).—"The Gold Fields of Victoria: Reports of the Mining Registrars for the Quarter ended March 31, 1886" (Ferres, Melbourne).—"Science and Art Directory," revised to July 1886.

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