polarisation of the dielectric by induction, followed by permanent polarisation by conduction.—Dr. Giuseppe Bardelli (xxx. xii.) gives a short mathematical note on certain simple relations between centres of gravity and moments of inertia.

Bulletin de la Société des Naturalistes de Moscou, 1896, No. 3.—The reptile fauna of Europe, by Dr. J. Bedriaga. Part 2. *Urodela* (continued). A further instalment of this important work, in German, is given.—On the means of obtaining cells without a nucleus, by J. J. Gerasimoff (in German). Having previously obtained such cells by keeping cells of *Spirogyra*, *Sirogonium* and *Zygnema* at a temperature below zero during the process of bi-partition, the author now obtained the same results by means of chloral hydrate, æther, and chloroform.—The histology of the skin of *Petromyzon*, by W. Kapelkin (in German, with two plates).—On changes taking place in the nerve-system and the inner organs after the resection of *Nervus vagus* and *Nervus splanchnicus*, by Dr. W. Niedzvietzky (in German, with four plates). Parts of the *vagus* nerve (about one inch long) were cut out in four rabbits, and of the *Nervus splanchnicus* in two dogs. The animals supported the operations very well, and seven, eight and nine months after the operation they were killed. The author now gives the anatomical changes which were observed, especially in the nerve-system of these rabbits.—Remarks relative to a paper printed by the author in the *Archiv für Psychiatrie*, by Mme. Olga Leonova (in German).

SOCIETIES AND ACADEMIES.

EDINBURGH.

Royal Society, July 5.—The Hon. Lord McLaren in the chair.—Mr. Thomas Heath read a note on the Calcutta earthquake (June 12, 1897), as recorded by the bifilar pendulum at the Edinburgh Royal Observatory. His results have been already communicated to NATURE (June 24, p. 174). He described the instrument as set up on Blackford Hill, and exhibited a model. Vibrations of a transient character due to shocks in or near the building were damped out by immersing the pendulum in the clearest paraffin oil. According to a rough calculation the seismic disturbance on the 12th took twenty-two minutes to travel 4970 miles in a great circle. There were absolutely no premonitory disturbances on the day of the earthquake, but there were indications of continued activity till the 16th. Reference was made to the services this instrument might render in "laying" a certain notorious ghost.—Prof. Tait briefly described the contents of a paper by Lord Kelvin and Dr. Magnus Maclean on leakage from electrified metal plates placed above and below uninsulated flames. The most important result—and an anomalous one apparently—was that the amount of discharge under a flame was much greater when the body ended in a plate than when it ended in a point.—In a paper on the antivenomous properties of the bile of serpents and other animals, and an explanation of the insusceptibility of animals to the poisonous action of venom introduced into the stomach, Prof. Fraser described the steps taken to isolate the constituent of the bile of serpents and other animals that render the venom harmless, and described various experiments on rabbits and white rats illustrating its use.—On the influence of excessive muscular work on the metabolism, by Drs. Dunlop, Noël Paton, Stockman and Mr. Ivison Macadam.—Dr. Gregg Wilson read a paper on the development of the Müllerian ducts of reptiles. In embryo reptiles the first foundation of the Müllerian ducts is a thickened plate of epithelium on the region of the excretory system that has been identified as pronephros. Growth backwards is quite independent both of the segmental duct and of the cœlomic epithelium posterior to the pronephric thickening. There is an anterior ventral extension of the foundation, comparable to the anterior part of the duct in elasmobranchs and to the temporary ventral extension of the Müllerian duct foundation in Rana.—Mr. J. A. Macdonald read a paper on the C discriminant as an envelope. The purpose of the paper was to find the conditions under which the discriminant of the equation

$$U = Ac^n + Bc^{n-1} + Dc^{n-2} + \ldots + Nc^2 + Pc + Q = 0$$

where A, B, &c. are synectic functions of x and y, and c is a parameter, yields a curve which at every point of its length is touched by one of the curves of the system $U = 0$.

Scottish Meteorological Society, July 19.—Extreme variation of the surface temperature of the ocean for every two degrees square, by Dr. John Murray, F.R.S.—Hourly variation of the rainfall at Ben Nevis and Fort-William Observatories, by R. T. Omond.—Some striking peculiarities of the weather of June last, by R. C. Mossman.—Exhibition of a convenient apparatus for the determination of the temperature of saturated steam in connection with barometric pressure, by J. Y. Buchanan, F.R.S.

MANCHESTER.

Literary and Philosophical Society, July 2.—Dr. Edward Schunck, F.R.S., in the chair.—The meeting was held for the presentation of the Wilde medals, and the delivery of the Wilde lecture. The Wilde medal for 1896 was awarded to Sir George Gabriel Stokes "for his pre-eminent services to mathematical and physical science, and in regard of the standing which he occupies in relation to the leading physicists of this and other countries." The Wilde medal for 1897 was awarded to Sir William Huggins "for his researches on the application of spectrum analysis to solar and stellar physics." The state of Sir William Huggins' health unfortunately prevented him from receiving the medal in person.—The premium, under the Wilde Trust, for 1897 was awarded to Mr. Peter Cameron for his papers, published by the Society, on Hymenoptera Orientalia.—Sir George Stokes then delivered the Wilde lecture on "The Nature of the Röntgen Rays."

PARIS.

Academy of Sciences, July 12.—M. de Chatin in the chair.—The Perpetual Secretary announced to the Academy the loss it had sustained by the death of M. Steenstrup, Correspondant in the Section of Anatomy and Zoology.—Approximate theory of the passage from a gradually varied to a rapidly varied state, or *vice versâ*, by M. J. Boussinesq.—On the employment of copper salts in the estimation of several elements in cast iron and steel, by MM. Ad. Carnot and Goutal. A modification of the cupric ammonium chloride method for the estimation of carbon in steel is described, which permits of a complete determination in less than two hours. Sulphur may be determined by a similar method with equally satisfactory results. In the residue, the chromium, tungsten, and titanium may be estimated.—M. Gayon was elected Correspondant in the Section of Rural Economy, in the place of M. Hellriegel.—Treatment of psoriasis by intra-muscular injections of orchitine, by M. F. Bouffé.—Researches on the ostioles, by M. J. J. Andeer.—On the actual state of the geodesic work in Russian Turkestan, by M. Venukoff.—Observations on the periodical comet of D'Arrest, made at the Observatory of Toulouse with the large Gautier telescope and the Brunner equatorial, by M. F. Rossard.—Observations on the same comet, made at the Observatory of Algiers, by MM. Rambaud and Sy.—On the linear differential equations belonging to the Riemann class, by M. F. Marotte.—Magnetarium designed to reproduce the phenomena of terrestrial magnetism and the secular changes of the horizontal and vertical components, by M. Wilde.—On the absorption of light by crystals, by M. V. Agafonoff.—On a standard thermal mercury voltmeter, and on some applications of the calorimetric method in electric measurements, by M. Charles Camichel. The indications of the instrument are given by the expansion of column of mercury, about one metre long, after the current has been passing for a known interval of time.—A new optical method of studying alternating currents, by MM. H. Abraham and H. Buisson. The rotation produced by the current in a concentrated solution of an alkaline iodomercurate is not directly measured as in the method of Pionchon, but is reduced to zero by applying a second bobbin carrying a continuous current capable of being directly measured. In the curve thus obtained the positive and negative parts are not found to be exactly symmetrical.—Physiological action of the galvanic current, by M. Dubois.—Electrical influence by Crookes' tubes, by M. Foveau de Courmelles.—On the complexity of the bundle of X-rays, by MM. A. Imbert and H. Bertin-Sans. After prolonged use, a Crookes' tube emits rays which appear to differ from the X-rays at first produced, inasmuch as they are able to traverse bodies relatively opaque to the X-rays without appreciable absorption.—On mercury pumps without taps, by M. Chabaud. The mercury pump described in a recent note by M. Henriet (see p. 263), is not new; neither does it present any advantage over the form with valve.—On some basic salts of copper, and on the brown hydrate of copper, by

M. Paul Sabatier.—On the reduction of molybdic anhydride by hydrogen, and on the preparation of pure molybdenum, by M. M. Guichard. The reduction may be completed at 500° C. if the reaction is sufficiently prolonged. The experiments afford no evidence of the existence of any oxides of molybdenum, but $Mo.O_3$ and $Mo.O_2$.—Action of benzoyl chloride upon the mono-substituted derivatives of the orthodiamines, by M. Fernand Muttelet. In the cold, and in presence of a solvent, a benzoyl derivative is obtained, but at 220°, in presence of an excess of benzoyl chloride, an internal anhydride is formed.—On the formation of mixed hydrates of acetylene and some other gases, by MM. de Forcrand and Sully Thomas. A description of a crystallised compound of acetylene, carbon tetrachloride and water.—Action of sulphuric acid upon lævorotatory terebenthene, by MM. G. Bouchardat and J. Lafont.—Development of aromatic principles by alcoholic fermentation in presence of certain leaves, by M. Georges Jacquemin.—On a new hydrolytic enzyme, caroubinase, by M. J. Effront.—The optical analysis of urine, by M. Frédéric Landolph.—Composition of haricots, lentils, and peas, by M. Balland.—Physiological action of the venom of the Japanese salamander (*Sieboldia maxima*). Attenuation by heat, and vaccination of the frog against the poison, by M. C. Phisalix.—Trophic troubles, resulting from the section of the cervical sympathetic, by MM. J. P. Morat and M. Doyon.—The centrifugal elements of the posterior medullary roots, by MM. J. P. Morat and C. Bonne.—Perforated muscle of the hand. Its appearance in the animal series, by M. A. Perrin.—On two new types of Crustaceæ (Isopods) belonging to the subterranean fauna of the Cévennes, by M. A. Dollfus.—Remarks on the sense organs of the *Sphæromides Raymondi*, *Stenasellus virei*, and of some Ascellidæ, by M. Arm. Viré.—On the defence of vines against the attacks of Cochylis, by M. P. Cazeneuve.—Remark on the subject of the methods of destruction of Cochylis in the vine, by M. Émile Blanchard.—On the tubercles of Orchidaceæ, by M. Leclerc du Sablon.—On the replacement of the principal root by a radical in Dicotyledons, by M. Boirivant.

ST. LOUIS.

Academy of Science, June 7.—Mr. Robert Combs, of Ames, Iowa, presented a paper entitled "Plants collected in the District of Cienfuegos, Province of Santa Clara, Cuba, in 1895-96." The paper embraces the results of a collection extending from the commencement of the rainy season of one year until the close of the dry season the following spring, the territory covered by the collection lying between the entrance of the bay of Cienfuegos, on the south coast of Cuba, up the bay and the river Damuji to Rodas, and extending back from the river to Yaguaramos, and almost to the Cienega de Zapato, a region including nearly all kinds of soil and condition found upon the island, except those of the mountain regions and the mud swamps. A brief statement was made concerning the origin of the Cuban flora, and its affinities with that of continental Central America, rather than the geographically nearer Floridan region. The paper comprised a full catalogue of the collections made, which had been determined at the herbarium of Harvard University, and of which several sets had been distributed to the larger herbaria.—Prof. F. E. Nipher made some remarks on the difficulties yet involved in the theories of the ether.

NEW SOUTH WALES.

Royal Society, June 2.—The President, Mr. Henry Deane, in the chair.—A contribution to the study of oxygen at low pressures, by Prof. R. Threlfall and Florence Martin. There is known to be a pressure (about 0·7 mm. of mercury) at which oxygen becomes unstable in its volumes and pressure relations. This instability may plausibly be attributed to a change in the chemical nature of the gas, and during the period of change it is possible that ozone may be temporarily produced. An experiment was made with the object of investigating whether oxygen can form ozone simply by virtue of a reduction of pressure. A suitable indicator having been discovered, an experiment was satisfactorily carried out showing either that no ozone at all is formed when the pressure falls to from 0·4 to 0·1 mm., or that, if such formation does occur, it is to an extent less than 0·005 per cent. of the volume of the gas employed.—Determination of the orbit elements of comet of 1896 (Perrine), by C. J. Merfield. The author explained that his deductions were based on observations made in various American and European observatories, and also on observations made by Mr. John Tebbutt, of Windsor, New South Wales. The elements as determined by him agreed substantially with those determined by Dr. Knopf, and would not, in his opinion, be sensibly varied by further investigations.

GÖTTINGEN.

Royal Society of Sciences.—The *Nachrichten* (mathematico-physical section), Part 1 for 1897, contains the following memoirs presented to the Society.

January 9.—P. Stäckel: Extracts from the correspondence of Gauss with W. Bolyai. R. Müller: Approximately rectilinear motion by means of the jointed quadrilateral. W. Schur: The polar flattening of the planet Mars.

February 6.—W. Voigt: The kinetic theory of ideal fluids.

February 20.—D. Hilbert: Diophantine equations. A. Wirnau: The substitution-groups of eight things.

March 6.—D. Hilbert: On the development of a given analytical function of one variable as an infinite series of rational integral functions. A. Hurwitz: On the generation of invariants by integration.

The accompanying *Geschäftliche Mittheilungen* include a memoir of Karl Weierstrass by David Hilbert, of Ernst Curtius by F. Leo, and of August Kekulé by Otto Wallach.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

BOOKS.—The Voyages made by the Sieur D. B. to the Islands Dauphine or Madagascar, &c.: translated and edited by Captain P. Oliver (Nutt).—Elemente der Geologie: Dr. H. Credner, Achte Auflage (Leipzig, Engelmann).—Fifteenth Annual Report of the Fishery Board for Scotland, Part 3 (Edinburgh).—Wild Flowers of Scotland: J. H. Crawford (Macqueen).—The Elementary Part of a Treatise on the Dynamics of a System of Rigid Bodies: Dr. E. J. Routh, 6th edition (Macmillan).—Introductory Course in Differential Equations: Dr. D. A. Murray (Longmans).—Modern Mythology: Andrew Lang (Longmans).—Our Coal Resources at the Close of the Nineteenth Century: Dr. E. Hull (Spon).—Ludwig Otto Hesse's Gasammelte Werke (München, K. Akademie).—The Ascent of Man: H. Drummond, new edition (Hodder).—Among British Birds in their Nesting Haunts: O. A. J. Lee, part v. (Edinburgh, Douglas).

PAMPHLETS.—Effects of the Weather upon Vegetation: J. Clayton (Bradford, Byles).—Nel Paese della Amazzoni: Dr. V. Grossi (Roma).

SERIALS.—Proceedings of the Physical Society of London, Vol. xv. Part 7 (Taylor).—Quarterly Review, July (Murray).—Terrestrial Magnetism, June (Wesley).—Engineering Magazine, July (Tucker).—Proceedings of the Royal Society of Queensland, Vol. xii. (Brisbane)—Journal and Proceedings of the Royal Society of New South Wales for 1896 (Sydney).

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