

pamphlet should be translated for the use of corresponding English associations. Why should not she undertake the task, if she has the leisure?—Prof. A. S. Chessin gives an abstract of Painlevé's *Leçons sur l'intégration des équations différentielles de la Mécanique et Applications*, and of his *Leçons sur le Frottement*.—The other articles are a geometric proof of a fundamental theorem concerning unicursal curves, by Prof. Osgood; Notes on the expression for a velocity-potential in terms of functions of Laplace and Bessel, by Prof. J. McMahon, and an additional note on divergent series by Prof. A. S. Chessin.—In the Notes we are told that the German Mathematical Society, at its meeting held at Lübeck, in September last, decided to combine in one volume the official reports of the Vienna and Lübeck meetings.—A list of papers, in addition to that given in vol. i. of the *Bulletin*, completes the tale of papers read at the Vienna meeting (1894), and the titles and names of authors for the Lübeck meeting are also given here.

American Meteorological Journal, March.—The diurnal oscillation of atmospheric pressure at the Peruvian stations of Harvard College Observatory, by Prof. S. I. Bailey. (A note upon this paper will be found in our issue of March 26, p. 493).—Cyclones and anticyclones, by Prof. H. A. Hazen. The author gives an epitome of the theories and researches of the principal investigators, and makes a special appeal for further atmospheric exploration. He considers that the most promising line of research is in connection with the observation of atmospheric electricity, and some useful hints are given with reference to the most promising means of increasing our knowledge by observations on high mountains and balloons, either manned or carrying recording instruments only.

Himmel und Erde, March.—This number contains many attractive contributions.—Herr Paul Spies writes on the Röntgen X-rays, this article being the sum and substance of a lecture delivered by him in the Urania at Berlin. Johann Christian Doppler and the "principle" connected with his name is the subject treated of by Dr. Julius Scheiner. That which is generally known about Doppler's life has been drawn from the biographical notice contained in the almanack of the Kaiserl. Akademie der Wissenschaft in Wien, which was written by the, then, general Secretary of the Academy, Prof. Strotter. With the help of Prof. Safarik, Dr. Scheiner is here able to increase our information on many points of interest, by publishing for the first time some characteristic notes gathered from Prof. Koristka, of the German Polytechnic in Prague.—The *Mitteilungen* contain several astronomical notes. A reference, with an illustration, is made to the Fabricius monument which was erected at Oostee last November. This monument consists of the goddess of astronomy in a sitting position, and looking towards the sky, holding in her right hand a small telescope, and supporting with her left a tablet on which in relief is seen the solar disc with some spots on his surface. The time of rotation of Jupiter and the cosmical origin of meteors form subjects for the next two notes, the latter referring more especially to Niessl's investigation, which appeared in the *Denkschriften der Wiener Akademie*. Two other notes refer to the "Internationale Erdmessung" and to the possible inconstancy of the length of a day, this latter having been raised by Prof. Deichmüller, who considers that very small secular variations may be present, although they have not as yet been detected.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, March 19.—"On the Spinal-root Connections and Ganglion-cell Connections of the Nerve-fibres which produce Contraction of the Spleen." By Prof. E. A. Schäfer, F.R.S., and B. Moore.

We have investigated, in four dogs, the effects upon the spleen volume of excitation of the thoracic and lumbar nerve-roots.

The following are the results which we have obtained from excitation of the nerve-roots from the second postcervical to the fifteenth postcervical inclusive. In none of the four experiments did excitation of the *second* postcervical (second dorsal) pair produce any contraction of the spleen. In none of the four experiments did excitation of the *fifteenth* postcervical pair produce any contraction of the spleen. In three out of the

four experiments a distinct contraction of the spleen was got on stimulation of all the roots on both sides from the third postcervical to the fourteenth postcervical inclusive. This effect was relatively smaller on stimulation of the third and fourth postcervical nerves and of the eleventh to the fourteenth postcervical than on stimulation of the intermediate pairs, the most marked effects being obtained from the sixth, seventh, and eighth pairs. In all cases the effect was got, as already stated, from the nerve-roots of *both sides*, but with each nerve pair it comes out as an almost constant occurrence that a decidedly less marked effect is obtained with the same strength of stimulus upon the right side than upon the left.

We have found that after intravenous injection of small doses of nicotine, the effect upon the spleen of stimulating the nerve-roots may entirely disappear, while stimulation of the splanchnics is still quite effective. We infer, therefore, that the nerve-fibres which produce contraction of the spleen have a cell station in the prevertebral chain of ganglia.

"Problems in Electric Convection." By G. F. C. Searle.

The paper contains an investigation into the distribution of electric and magnetic forces which are called into play when some electro-magnetic systems are made to move with uniform velocity through the ether. Maxwell's theory is employed in obtaining the fundamental equations, and it is found that though the electric and magnetic forces, E and H , have generally no potential, still they can be derived from two functions Ψ and Ω ; the differential equations satisfied by these functions are obtained, and are employed to obtain the solutions for various cases and conditions.

Zoological Society, March 17.—Prof. G. B. Howes in the chair.—Mr. Sclater called the attention of the meeting to the prospectus of the great work of the German Zoological Society, to be called "Das Tierreich," spoken of at the last meeting, and gave some particulars as to the mode in which the plan was intended to be carried out. Mr. Sclater also called attention to the appointment of a Committee on Zoological Nomenclature at the International Zoological Congress held at Leyden last year.—A communication was read from Lieut.-Colonel C. T. Bingham, containing a contribution to the knowledge of the hymenopterous fauna of Ceylon.—A communication was read from Mr. Edward T. Browne, on British Hydroids and Medusæ. Mr. A. Smith Woodward read a paper on some extinct fishes of the Teleostean family Gonorhynchidæ.

Entomological Society, March 18.—Prof. Raphael Meldola, F.R.S., President, in the chair.—Mr. C. G. Barrett exhibited a series of drawings of varieties of British Lepidoptera in the collection of Mr. S. J. Capper, of Huyton Park, Liverpool. The drawings, which were beautifully executed, were by Mr. S. L. Mosley, of Huddersfield, and comprised 389 figures, representing 139 species, of which 33 were butterflies and 50 moths.—Mr. J. J. Walker, R.N., exhibited a specimen of *Procas armillatus*, taken on Durland Hill, near Chatham, during the present month.—Herr Jacoby exhibited a specimen of *Loxoprosopus cerambothides*, Guér., from Brazil.—Mr. E. E. Green exhibited the eggs of some species of Locustidæ extracted from the stem of a young cinchona tree at Punduloya, Ceylon. He said the species of the parent insect was undetermined; it was possibly either a *Cymatomera* or a *Cyrtophyllus*, both of which possess large sabre-shaped ovipositors. A slit half inch deep and more than two inches long had been cut into the hard wood, in which the eggs had been symmetrically deposited, edge to edge, with the coloured part inwards. The greater part of each egg was of fine texture, and coloured green; but at the extremity from which the young insect would make its exit the egg-shell was soft, pliant, and beautifully reticulated. Mr. McLachlan and Dr. Sharp, F.R.S., made some remarks on the subject.—Mr. Green read a short paper entitled "Notes on *Dyscritina longisetosa*, Westw." He remarked that drawings of the species had been exhibited by him at a recent meeting of the Society. Dr. Sharp said Mr. Green seemed to think that the insect was an earwig, but he could not accept it as belonging to the Forficulidæ. He thought that further specimens for examination were required before attempting to determine its position, which was quite doubtful at present.—Mr. W. F. H. Blandford communicated a paper entitled "Descriptions of New Oriental *Scolytidæ*."

Linnean Society, March 19.—Mr. C. B. Clarke, F.R.S., President, in the chair.—Mr. Clement Reid exhibited fruits of *Naias marina* from a peaty deposit below mean-tide level in the new docks at Barry, South Wales. In Britain it had only been found living at a single locality in Norfolk, but in a fossil con-

dition it had been obtained in the pre-glacial forest-bed at Cromer.—Mr. Clement Reid also exhibited some wood forwarded by Mr. H. N. Ridley from the jungle near Singapore. It appeared to have been eaten into a honeycombed mass of peculiar character, and was found only in wet places, but always above ground, the entire tree rotting. Neither Mr. Ridley nor Mr. Reid had seen anything like it in England; and the latter, while suggesting that the small lenticular unconnected cavities in the wood were probably caused by insects or their larvæ, thought they were unlike the work of either beetles or white ants.—A paper was read by Dr. Otto Stapf on the structure of the female flowers and fruit of *Sararanga*, Hemsley. The materials utilised consisted of female flowers and fruits of *Sararanga sinuosa*, Hemsley (*Journ. Linn. Soc.*, vol. xxx. p. 216, t. 11), which had been collected by the officers of H.M.S. *Penang* in New Georgia, Solomon Islands, and were in excellent preservation. There were also photographs and a description, taken upon the spot, of the tree, about 60 feet high, shortly branched at the top, with terminal, nodding, white-flowered, very compound, and gigantic panicles. The leaves are like those of an ordinary screw-pine. The flowers consist of a rudimentary, sinuously bent, saucer shaped perianth, and a sub-globose, sinuously lobed gynæcium, with very numerous (70–80), dark, discoid, or reniform stigmas which are arranged in double rows over the dorsal ridges of the main body and the lobes, having between them minute pores which end behind some way below the surface. There are as many ovary-cells as stigmas, each containing one anatropous ovule from the base of the inner angle. The vascular bundles of the gynæcium end below the stigma in a cluster of tracheids, and supply it probably with a viscid or sugary liquid. The base of the pore is surrounded by a compact, thin-walled parenchyma, very rich in plasma. It is suggested that the pollen-tubes grow from the stigma down into the pore, and descend from here through the conductive tissue to the ovule. The ripe fruit is a succulent drupe with numerous pyrenes, in shape like the flower, but much larger. The endocarp is bony, the albumen copious and oily; the embryo is as in *Pandanus*. The complex structure of the flower is explained as a modification of the type represented, e.g. in *Pandanus utilis*, and in accordance with Count Solms-Laubach's theory of the flower of the Pandanaceæ. On this paper some critical remarks were offered by Mr. Rendle.—On behalf of Mr. G. S. West, a paper was read by Prof. Howes on two little-known Opisthogyphous Snakes. The author had examined and compared, in respect of the structure of the buccal glands and teeth, specimens of the grooved and non-grooved varieties of *Erythrolamprus asculapii*, as recorded by Dr. Günther ("Biologia Centr.-Amer.," part cxxi. p. 166), and he proved that the latter were rightly referred to the species.

Geological Society, March 25.—Dr. Henry Hicks, F.R.S., President, in the chair.—On submerged land-surfaces at Barry, Glamorganshire, by A. Strahan, with notes on the fauna and flora by Clement Reid, and an appendix on the Microzoa by Prof. T. Rupert Jones, F.R.S., and F. Chapman. Excavations for a new dock at Barry have disclosed a series of freshwater or slightly estuarine silts with intercalated peats, below sea-level on the north-eastern side of the island. The site of the excavation was overflowed by the tide until the year 1884, when the docks were commenced. The newest deposits seen are, therefore, blown sand, *Scrobicularia*-clay, and sand or shingle with recent marine shells. These rest on an eroded surface of blue silt, with sedges in position of growth. Four peat-beds occur in this silt, at 4, 11, 20, and 35 feet below Ordnance datum respectively. The uppermost peat contains a seam of shell-marl, partly composed of the shells of ostracoda, and partly of *Bythinia*, *Limnea*, &c. The second is a mass of matted sedges. The third is a land-surface, and in places consists almost wholly of timber with the stools and roots *in situ*. The fourth is also an old land-surface, as is proved not only by the presence of roots in place beneath it, but by numerous land-shells. A fragment of a polished flint-celt was found by Mr. Storrie embedded in the lower part of the uppermost peat. By a comparison with the existing maritime marshes of the neighbourhood, it was shown that the fourth peat indicates a subsidence of not less than 55 feet. The sea encroached upon the area in consequence of this subsidence. It entered by the lowest of three low cols in the southern water-parting of the Cadoxton River, thus isolating the portion of land now known as Barry Island. A slight further movement would have converted the water-parting into a chain of islands.—On a phosphatic

chalk with *Holaster planus* at Lewes, by A. Strahan, with an appendix on the ostracoda and foraminifera by F. Chapman. This rock, which occurs at the base of the upper chalk, at the horizon of the chalk rock, does not exceed 1½ feet in thickness, and persists for a few yards only. In composition and microscopic character it presents a close analogy to the Taplow phosphatic deposit, which, however, occurs at the top of the upper chalk. Like it, it consists of brown phosphatic grains embedded in a white chalky matrix. The grains include a large number of pellets, attributable to small fish, phosphatised foraminifera, chips of bone, &c. Fish-teeth also occur in abundance. To complete the resemblance, the Lewes deposit rests on a floor of hard nodular chalk, beneath which is a white chalk traversed by irregular branching pipes filled with the brown variety. Such "floors" were attributed to concretionary action ensuing upon a pause in the sedimentation. The piped chalk was compared with the structure known as *Spongia paradoxica*. It was concluded that phosphatised deposits may occur at any horizon in the chalk; that the phosphatisation is due to small fishes, attracted by an unusual abundance of food; that they are shallow-water deposits, and associated with a pause or change in the sedimentation. Mr. Chapman furnished a list of 42 species and varieties of foraminifera, and 6 species of ostracoda. The former indicate a deeper water origin than do those of the Taplow chalk. He noted the occurrence for the first time in this country of *Gypsina Coeete*, Marrson.—On the classification of the strata between the Kimeridgian and the Aptian, by Dr. A. P. Pavlow, Professor of Geology in the University of Moscow. In this paper the author discussed the new evidence respecting the palæontology of the Lower Cretaceous and Upper Jurassic deposits of Russia, which had come to light since the publication, by Mr. Lamplugh and himself, of "Les Argiles de Speeton et leurs Equivalents" (Moscow, 1892).

DUBLIN.

Royal Dublin Society, March 18.—Prof. G. F. Fitzgerald, F.R.S., in the chair.—A paper was read on the Röntgen X-rays, by Mr. Richard J. Moss (see NATURE, April 2, p. 523).—Prof. Arthur A. Rambaut read a note on the rotation period of dark spots on Jupiter.—A memoir on the carboniferous Ostracoda of Ireland, by Prof. Rupert Jones, F.R.S., and Mr. J. W. Kirkby, was communicated by Prof. W. J. Sollas, F.R.S.

PARIS.

Academy of Sciences, March 30.—M. A. Cornu in the chair.—On the properties of the invisible radiations emitted by uranium salts, and by the antikathodic wall of a Crookes' tube, by M. Henri Becquerel. The rays given off by uranium salts are doubly refracted by tourmaline, a parallel experiment with a Crookes' tube giving a negative result.—On the variations in the brightness of the star Mira-Ceti, by M. Duménil.—On the inversion of systems of total differentials, by M. P. Painlevé.—Extension of the theorem of Cauchy to more general systems of partial differential equations, by M. E. Delassus.—On the penetration of gases into the glass walls of Crookes' tubes, by M. Gouy. Glass which has been exposed to intense cathodic rays gives off numerous bubbles of gas on heating.—On the use of non-uniform magnetic fields in photography with the X-rays, by M. G. Meslin.—The time of exposure in photography by the X-rays, by M. J. Chappuis. The effect produced by a Crookes' tube upon a gold-leaf electroscope was studied under varying conditions. An increased action was obtained by concentrating the rays by a strong magnetic field, and especially by replacing the ordinary metallic contact-breaker by a Foucault's interrupter.—Action of the X-rays upon electrified bodies, by MM. Benoist and Hurmuzescu. In reply to criticisms by MM. Righi, Dufour, and Borgmann and Gerchun, the authors have repeated their original experiments with additional precautions, and find that the discharge of an electrified body by the rays is complete, and is independent of the sign of the original charge. Different metals appear to be discharged at different rates, a result difficult to explain by the theory advanced by Prof. J. J. Thomson, that dielectrics become conductors under the action of the X-rays.—On the refraction of the Röntgen rays, by M. F. Beaulard. With a prism of ebonite no clear evidence of deviation could be obtained.—On the diffraction and polarisation of the Röntgen rays, by M. G. Sagnac.—Stereoscopic photographs obtained with the X-rays, by MM. A. Imbert and H. Bertin-Sans.—Determination of the exact position of a foreign body in

the tissues by means of the X-rays, by MM. A. Buguet and A. Gascard.—Experiments relating to the action of the X-rays on *Phycomyces nitens*, by M. L. Errera. This *Phycomyces* was not sensitive to these radiations.—On the Röntgen rays, by M. C. Henry. General considerations as to the nature of the rays, and a résumé of their properties.—Reply to some observations of M. Henri Becquerel relating to a note "On the principle of an accumulator of light," by M. C. Henry.—Remarks on the preceding, by M. Henri Becquerel.—Safrol and isosafrol. Synthesis of isosafrol, by M. C. Moureu.—On citronnellal and its isomerism with rhodinol, by MM. P. Barbier and L. Bouveault.—On the macroblasts of the oyster; their origin and localisation, by M. J. Chatin.—On the relations between *Lepismima myrmecophila* and ants, by M. C. Janet.—On the tertiary basin of the lower valley of the Tafna, by M. L. Gentil.

AMSTERDAM.

Royal Academy of Sciences, January 25.—Prof. Van de Sande Bakhuyzen in the chair.—Prof. Lorentz showed a number of photographs prepared by means of X-rays by Prof. Röntgen, of Würzburg.—Prof. MacGillavry presented the dissertation of Dr. D. MacGillavry on the actiology and the pathogenesis of congenital defects of the heart.—Mr. Jan de Vries gave applications of the introduction of a third radius vector into the bipolar system, so that the three poles lie in a straight line.—Prof. Schoute treated Steiner's quartic surface $y^2z^2 + z^2x^2 + x^2y^2 = 2kxyz$.—Prof. Engelmann communicated the result of an investigation made by Dr. H. J. Hamburger into the importance of respiration and peristaltics to the resorption in the intestine. The resorption of liquids in the alimentary canal increases with the intra-intestinal pressure, and disappears altogether when this pressure is artificially lowered to 0 or a negative value.—Prof. Kamerlingh Onnes made, on behalf of Mr. D. van Gulik, a communication concerning an investigation made, under the direction of Prof. Haga, at Groningen, into the cause of the variation of resistance in microphonic contacts brought about by electric vibrations. In investigating the cause of the diminution of resistance through electric vibrations generated in bad microphonic contacts, it has been ascertained that the ends of a current-chain, when brought very close together, attract each other if the wires are exposed to Hertz's waves. The arrangements being made with proper care, the movable ends were seen under a microscope to touch each other as soon as electric vibrations were generated near them. The original air-gap must not be larger than four microns, and a contact arisen in this way offered a resistance of $\frac{1}{4} \Omega$ to the current. The removal of the element from the chain had no influence upon the phenomenon. When the air-gap was a few microns too large, then small sparks resulted on the wires being acted upon by the above-mentioned waves. Prof. Kamerlingh Onnes, starting from his theorem that Van der Waals's corresponding states are dynamically similar, inferred that the cooling of the gas in Thomson and Joule's porous plug will, according to their experiments with hydrogen (1862), become zero and turn into heating, with all gases, at sufficiently high temperatures. The author extended the theorem to thermo-dynamical similarity, and thus supplied the means to find the dimensions of an apparatus to liquefy hydrogen, if there is given one liquefying oxygen in a satisfactory manner. Linde's and Dewar's methods were considered from this point of view. The author also commented on his endeavours to get a small self-cooling motor, liquefying oxygen, to be used as a model for apparatus to liquefy hydrogen by doing work adiabatically after the manner of Solvay, and intended to form part of a series of theoretically perfect cooling apparatus. Finally the author pointed out the superiority of Dewar's vacuum-jackets, and their great importance for low temperature work.

February 29.—Prof. van de Sande Bakhuyzen in the chair.—Prof. Suringar described, in connection with previous communications, some *Melocacti*, lately received from the island of St. Martin, and belonging to the tribe of *Melocacti communes*. They most nearly approach to the one described by Link and Otto as *M. communis*, var. *macrocephalus*. They represent two types, which speaker has called *M. (communis) Linkii* and *M. (communis) croceus*, the name *communis* between parentheses indicating the affinity. From a comparison of the specimens discussed with those the author formerly brought away from St. Eustace, and with the description and drawing by Hooker of specimens from the island of St. Kitts, it appears that in these islands, situated very near each other, distinctly different, constant varieties of the

common type have developed themselves. This had induced the author to collect and to critically examine all the older accounts, and especially the drawings by Lobelius (1576) down to Miquel's monograph (1840). In anticipation of the Iconography, which he is preparing, he presented a treatise on the subject, as a fourth contribution to the *Transactions* of the Academy. It treats partly of crook-thorned *Melocacti*, to which those of Lobelius and Besler belong, and of which the author has found a variety of species in Aruba; partly and especially of *Melocacti* of the *Melocacti communes* tribe, peculiar to the Northern Antilles, and which treatise will be illustrated by two plates.—Mr. Jan de Vries made a communication concerning Cartesian confocal ovals in connection with a hyperboloid of one surface.—Prof. Rauwenhoff communicated the results of investigations, made by Dr. H. F. Jonkman at Utrecht, into the embryogeny of Angiopteris and Marattia.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

BOOKS.—The Island of Dr. Moreau: H. G. Wells (Heinemann).—A Manual of Forestry: Prof. W. Schlich, Vol. 1, 2nd edition (Bradbury).—Die Vegetation der Erde. I. Grundzüge der Pflanzenverbreitung auf der Iberischen Halbinsel: M. Willkomm (Leipzig, Engelmann).—Monographie der Gattung Euphrasia: Dr. R. v. Wettstein (Leipzig, Engelmann).—A Handbook to the Birds of Great Britain: Dr. R. B. Sharpe, Vol. 3 (Allen).—Röntgen Photographs: Prof. Reid and Kuenen (Dundee, Valentine).—Leçons de Géographie Physique: Prof. A. de Lapparent (Paris, Masson). PAMPHLETS.—Summary Report of the Geological Survey Department for the Year 1895 (Ottawa).—A Laboratory Note-Book of Elementary Practical Physics: L. R. Wilberforce and T. C. Fitzpatrick. I. Mechanics and Hydrostatics (Cambridge University Press).—Kepler's Lehre von der Gravitation; Dr. E. Goldbeck (Halle a/s., Niemeyer).—Flora of West Virginia: C. F. Millsvaugh and L. W. Nuttall (Chicago).—The Classification of the Chemical Elements: Prof. O. Masson (Melville).—The Jack Rabbits of the U.S.: Dr. T. S. Palmer (Washington). SERIALS.—Fortnightly Review, April (Chapman).—Scribner's Magazine, April (Low).—Geological Magazine, April (Dulau).—Imperial University College of Agriculture, Bulletin Vol. ii. No. 5 (Tokyo).—Reliquary and Illustrated Archaeologist, April (Bemrose).—Journal of the Royal Agricultural Society of England, third series, Vol. vii. Part 1 (Murray).—Geographical Journal, April (Stanford).—Phonographic Quarterly Review, April (Pitman).—Zeitschrift für Physikalische Chemie, xix. Band, 3 Heft (Leipzig, Engelmann).—Annals of Scottish Natural History, April (Edinburgh, Douglas).

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