

## SOCIETIES AND ACADEMIES.

## LONDON.

**Royal Society**, March 9.—“On the Structure and Affinities of *Matonia pectinata*, R. Br., with an Account of the Geological History of the Matonineæ.” By A. C. Seward, F.R.S., University Lecturer in Botany, Cambridge.

The genus *Matonia* has long been known as an isolated type among existing ferns. It is represented by two species, *M. pectinata* R. Brown and *M. sarmentosa* Baker, both confined to the Malayan region. *Matonia* has not hitherto been examined anatomically, and its reference by several writers to an intermediate position between the Cyatheaceæ and Gleicheniaceæ, is based on the structure of the sorus, which, in the small numbers of sporangia and in its circular form, resembles the latter family, while the presence of an indusium and the position of the annulus afford connecting links with Cyatheaceous ferns.

In *Matonia pectinata* the frond has a characteristic pedate habit, with numerous long pinnae having slightly falcate linear segments, practically all of which appear to be fertile. The sori are circular in form and indusiate, consisting of about eight large sporangia with an oblique incomplete annulus. The dichotomously branched rhizome, which grows on the surface of the ground, is thickly covered with a felt of multicellular hairs, and gives rise to long-stalked fronds from its upper face, and a few wiry roots, which may arise from any part of the surface of the stem.

The material which rendered possible the investigation of the anatomical structure was generously supplied by Mr. Shelford, of the Sarawak Museum, Borneo.

The stem is polystelic, and of the gamostelic type; there may be two annular steles, with the centre of the stem occupied by ground-tissue, or in shorter branches of the rhizome a third vascular strand may occupy the axial region. Each stele consists of xylem tracheids and associated parenchyma, surrounded by phloem composed of large sieve-tubes, with numerous sieve-plates on the lateral walls, and phloem parenchyma; an endodermis and pericycle surround each stele, and in the case of the annular steles these layers occur both internally and externally. At the nodes the outer annular stele bends up into the leaf-stalk, and a branch is given off also from the margin of a gap formed in the inner annular stele; the axial vascular strand may or may not be in continuity with the meristele of the leaf. The petiole is traversed by a single stele, similar in shape to that of certain Cyatheaceous ferns.

The most interesting feature in the structure of the pinnules is the marked papillose form of the lower epidermal cells. The roots have a triarch stele enclosed by a few layers of thick brown sclerous cells.

In structure *Matonia pectinata* presents points of agreement with several families of ferns, on the whole approximating more closely to the Cyatheaceæ than to any other family; but the peculiarities are such as to fully confirm the conclusion previously drawn from external characters that *Matonia* should be placed in a separate division of the Filices.

In *Matonia* we have a survival of a family of ferns, now confined to a few localities in Borneo and the Malay peninsula, and represented by two living species, which in the Mesozoic epoch had a wide geographical range, being especially abundant in the European area.

“New Form of Light Mirrors.” By A. Mallock. Communicated by Lord Rayleigh.

The author in this paper describes a new form of light mirror, which he thinks may be useful in cases where extreme lightness and good definition have to be combined.

The mirrors are formed by stretching the thin films left on the surface of water, after a few drops of a solution of pyroxyline in amyl acetate have been allowed to spread there and evaporate, over rings whose edges have been ground to a true plane.

The contraction of the film in drying causes it to approach so closely to the plane in which the edge of the ring lies, that when used as a reflector, the definition is equal to that obtained from a worked glass surface of the same area, at any rate until the film is more than two and a half inches in diameter.

A two-inch diameter mirror may be made weighing considerably less than ten grains.

The author found considerable trouble, not yet completely overcome, in silvering the films; but success in this matter appears to depend entirely on securing extreme surface cleanliness both of the films and silvering bath, the films being in this

respect enormously more sensitive to surface tension influences than glass.

“On the Gastric Gland of Mollusca and Decapod Crustacea: its Structure and Functions.” By C. A. MacMunn, M.A., M.D. Communicated by Dr. M. Foster, Sec. R.S.

In 1883 the author communicated a paper to the Royal Society in which he described a pigment occurring in the so-called liver of Invertebrates, which from its resemblance to plant chlorophyll he named entero-chlorophyll, and in the *Philosophical Transactions* (Part i., 1886), a further contribution was published.

In the present paper the histology of the gland is dealt with, and additional observations made by means of the spectrophotometer, and otherwise, are described.

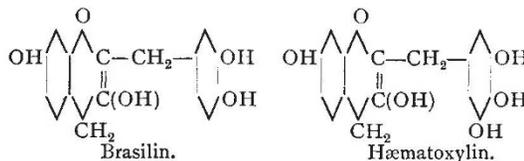
Great difficulties attend the preparation of the gland for microscopical purposes; the author has, however, succeeded in getting very satisfactory sections by means of formol—20 to 30 per cent.—followed by 95 per cent. alcohol, and embedding in celloidin. The sections being stained by hæmalum, eosin, mucicarmine, thionin, “Soudan III,” &c. Curves obtained by means of the spectrophotometer show that entero-chlorophyll and plant chlorophyll are not identical, but when the latter is changed into the well-known “modified” form, the maxima and minima correspond. From this and other data it appears that entero-chlorophyll is food chlorophyll which has been acted on by the digestive juices. A study of sections confirms this view, as one can see the entero-chlorophyll actually within the intestinal epithelium of *Patella*, *Mytilus*, &c., dissolved in a fatty medium, and between these epithelial cells, leucocytes, which carry it to the gastric gland and elsewhere, are seen insinuating themselves. In addition to its other functions, the gastric gland appears to be an organ of excretion.

**Physical Society**, March 24.—Prof. Oliver Lodge, F.R.S., President, in the chair.—Mr. W. R. Cooper read a paper by Mr. A. P. Trotter on the minor variations of the Clark cell. The author describes a series of experiments in which he compared the E.M.F. of certain standard cells at frequent intervals from July 1896 to February 1897, at Cape Town, where the temperature of the double box containing the cells varied between the limits 13° C. and 28° C. One cell was selected for comparison with all the others. No special precautions seem to have been taken to keep the temperature of this selected cell constant. The observed differences between the E.M.F. of the respective cells rarely exceeded 0.001, corresponding to about a quarter of an inch on the slide-wire of the potentiometer. Details as to the area of the slider-contact are not stated; the readings were generally taken to the fourth decimal, *i.e.* to one-tenth of a millivolt, and occasionally to one-fourth of this. Temperature was read to 0.1° C. on a mercury thermometer placed through a hole in the double box containing the cells—not in the cells themselves. Mr. E. H. Griffiths said that the paper appeared to have value only in so far as it showed that Clark cells at Cape Town behaved in a manner that agreed with common knowledge and general experience everywhere else. Their variations depended upon shifts of temperature, and the consequent changes in the degree of saturation of the liquid. From his own experiments during seven years, upon forty-two Clark cells, he had shown that if temperature was kept constant to within 0.01° C., the steadiness and uniformity of all the E.M.F.s was most remarkable. They started with discrepancies, but at the end of the time it was impossible to detect any differences. It was of little use to put a thermometer anywhere but within the cells; very slight changes of temperature caused serious changes in the degree of saturation of the liquid. The existence of the capricious lag of E.M.F. behind temperature precluded the possibility of formulating a temperature correction for Clark cells. In the case of Callendar cells there was no lag; their E.M.F. varied slightly with temperature, by a definite amount, which could be corrected by a coefficient. Mr. W. R. Cooper said the method of comparison used by the author was unsuitable, because to arrive at the differences of E.M.F. necessitated the measurement of the E.M.F. of each cell. The variations only amounted to a few ten-thousandths of a volt. The length of potentiometer-wire corresponding to a thousandth of a volt was only a quarter of an inch; under such conditions it would be difficult to ensure accuracy. A method of opposition would have been preferable. Mr. Cooper had found that Board of Trade cells only vary about

one ten-thousandth of a volt between themselves from day to day. Cells of the H-form vary about one-fifth of that amount.—Prof. J. D. Everett then read a paper by Dr. E. H. Barton and Mr. W. B. Morton, on the criterion for the oscillatory discharge of a condenser. The object of the paper is to inquire how the condition for the oscillatory discharge of a condenser is modified when the ordinary differential equation of the second degree is supplemented by the terms added by Maxwell to take account of the distribution of current in the (straight) wire. The coefficients of these terms are relatively small, so that the algebraic equation giving the periods is a quadratic with small terms of higher order added. The effect of these higher terms is, first, to introduce very rapid vibrations of small amplitude; and, next, to displace the roots of the unaltered quadratic. The nature of the discharge—oscillatory, or non-oscillatory—may be taken to be determined by these principal roots, and the critical case is when they are equal. The condition for equality is obtained, by the property of the derived function, as a series of powers of the small coefficients of the equation, which may be carried by successive approximation as far as is desired. The paper also treats the question by an alternative, and more physical, method, which consists in replacing the resistance, inductance, and capacity that occur in the ordinary formula, by modified values. This gives the criterion correct to the third order in the small terms. It is shown that a condenser satisfying the critical condition on the simple formula would, when the added terms are taken into account, give an oscillatory discharge. Prof. Lodge said that the result naturally to be expected of “throttling,” viz. the increase of resistance, and decrease of self-induction, due to the current keeping to the outside of the conductor, would tend rather to damp out the oscillations than to favour them. Prof. Everett observed that the equation was no longer a quadratic, and that the quadratic criterion as to whether the discharge was oscillatory or non-oscillatory, did not hold. The paper appeared to be consistent with itself, and he considered that the authors had satisfactorily proved, in their discussion of the equation of current, that the effect of “throttling” was to increase the tendency towards the oscillatory mode of discharge. Prof. Lodge admitted that the quadratic criterion did not hold; he thought it most likely that the authors, who evidently had gone into the matter with care, were right. At the same time he wished to call attention to the singular and unexpected character of their conclusion. If it turned out that it was correct, *i.e.* that there was no slip in sign, it was a result upon which he would desire to congratulate them.—The President proposed votes of thanks, and the meeting adjourned until April 21.

**Chemical Society, March 16.**—Prof. Dewar, President, in the chair.—After the presentation of a daguerreotype of Dalton to the Society by the President, the following papers were read:—The boiling point of liquid hydrogen as determined by a rhodium-platinum resistance thermometer, by J. Dewar. After successfully overcoming the experimental difficulties, the author has prepared considerable quantities of colourless liquid hydrogen for the purpose of determining its boiling point. A pure platinum resistance thermometer gave the boiling point as 35° absolute, whilst a rhodium-platinum resistance thermometer gave the boiling point as 27° absolute; by the use of a constant volume hydrogen thermometer working under reduced pressure the boiling-point of liquid hydrogen was found to be 20° absolute.—Influence of substitution on specific rotation in the bornylamine series, by M. O. Forster. The author has prepared and examined methylbornylamine, dimethylbornylamine, ethylbornylamine, diethylbornylamine, *n*- and iso-propylbornylamine, butylbornylamine, benzylbornylamine, and ortho- and para-nitrobenzylbornylamine in order to determine the influence of substitution upon the specific and molecular rotations of bornylamine.—Contribution to the characterisation of racemic compounds, by A. Ladenburg. The author amends his definition of racemism in the light of the experiments of Kipping and Pope.—Rotatory powers of optically active methoxy- and ethoxy-propionic acids prepared from active lactic acid, by T. Purdie and J. C. Irvine. Methyl methoxypropionate and ethyl ethoxypropionate, prepared from the *l*-lactates by the action of alkyl iodides and silver oxide, have the specific rotations  $-95.53^\circ$  and  $-79.69^\circ$  respectively; this confirms the previous conclusion that the high activity of the alkyl lactates made from the silver salt is due to the presence of alkyl-oxypionates.—On brasilin and hæmatoxylin (II.), by A. W.

Gilbody and W. H. Perkin, jun. From a study of the oxidation products of dimethylbrasilin, the authors conclude that brasilin and hæmatoxylin have the following constitutions:—



—Crystallisation of dynamic isomerides. A correction, by T. M. Lowry.

**Geological Society, March 8.**—W. Whitaker, F.R.S., President, in the chair.—An analysis of the genus *Micraster*, as determined by rigid zonal collecting, from the zone of *Rhynchonella Cuvieri* to that of *Micraster cor-anguinum*, by Dr. A. W. Rowe. The author has endeavoured to show, by means of rigid zonal collecting on a large scale, from the white chalk of the southern and south-eastern coast-sections of England, that the genus *Micraster* is one and the same form gradually evolving from the more simple to the more complex. In doing this, he also contends that the genus may be divided into definite groups, each or several of which are absolutely diagnostic of the various chalk zones, as defined by Barrois. The conclusions arrived at point to the regular and continuous deposition of the white chalk, and strikingly confirm the general accuracy of Barrois's zoning. The paper gives a minute comparison and description of the genus *Micraster* from a general point of view, and from that of a group, and deals particularly with the essential details of the test of the especial groups characteristic of each zone. The author claims that, so far as *Micraster* is concerned, each zone is marked by a definite facies of essential characters of the test, which are purely horizontal, and that all species and varieties, however divergent they may apparently be, occurring at any given horizon, are stamped with the impress of these marked horizontal features. The author proves that, while in an isolated instance, one may be unable to decide the horizon in the white chalk whence a specimen of *Micraster* was derived, in the ninety-nine other cases the diagnostic features described by him point unerringly to the exact horizon, and thus afford a valuable aid to stratigraphical geology, especially as the essential zonal features of the test are easily made out in the field.—On a sill and faulted inlier in Tideswell Dale (Derbyshire), by H. H. Arnold-Bemrose. The compact dolerite in the marble-quarry in Tideswell Dale has been generally described as a lava; but Sir A. Geikie, in his “Ancient Volcanoes of Great Britain,” suggested the possibility that it might be a sill. In the present paper the author endeavours to prove that the rock is really a sill.

**Entomological Society, March 15.**—Mr. G. H. Verrall, President, in the chair.—Mr. Tutt exhibited a very fine series of *Epunda lutulenta* captured by the Rev. C. R. N. Burrows last autumn near Mucking in Essex. This series, while agreeing in the main with Borkhausen's typical form, varied *inter se* in such a manner as to give almost parallel forms to those so well known from Scotland and Ireland, yet they had the ordinary blackish-fuscous ground colour, and not the intense black peculiar to the latter. Mr. Merrifield showed some Lepidoptera collected in the latter half of May and the first week of June, near Axolo (Venetia), Riva, and Bozen. They included some very fine specimens of *Syrichthys carthami*, a very large *Syntomis phegea*, and examples of *Pararge egeria* intermediate in colour between the Northern and Southern European forms. Mr. G. T. Porritt exhibited a series of extreme forms of *Arctia lubricipeda*, var. *fasciata*, and also some examples of what appeared to be a new form of the species. Mr. O. E. Janson exhibited an inflorescence of *Araujia albens*, Don., together with a butterfly which had been entrapped by getting its proboscis jammed in one of the flowers. It was found at Monte Video.

**Royal Microscopical Society, March 15.**—Mr. E. M. Nelson, President, in the chair.—The President called attention to a fine example of Wilson's screw-barrel microscope which had been presented by the Treasurer. The instrument was probably 150 years old, and would be a valuable addition to the Society's collection.—The President then said Mr. Curties had sent for exhibition an old microscope made by Chevalier, circa

1840; it was an early example of microscopes made after the introduction of achromatism.—Mr. Rousselet exhibited and described a mounted specimen of a rare rotiferon, *Trochosphaera solstitialis*, first found by Staff-Surgeon Gunson Thorpe in China. It had since been found in America, and the specimen now exhibited was probably the first seen in this country. The first species of this genus discovered *T. aequatorialis*, was found in the Philippine Islands by Prof. Semper, who described it in 1872.—Mr. Lewis Wright then gave an exhibition of microscope slides by means of his improved projection microscope, and demonstrated the progress made since he gave his previous exhibition before the Society fourteen and a half years ago. Several improvements had been made in the interval: in the condensers it had been found better to use four lenses, by which spherical aberration was practically abolished. He had also learned from the President the necessity for adjusting the cone of light to the aperture of the objective. The fine adjustment had been improved, and great advances had been made in objectives. An important improvement had been made in the screen, which was covered with a thin coating of silver, by which the brilliancy of the pictures was greatly increased. It was found that with a plain silvered surface the image could only be seen by persons in front of the screen; but by having the surface minutely striated vertically, persons seated at the sides could see quite well.—Dr. Hebb said another paper had been received from Mr. Millett, being Part v. of his report on the Foraminifera of the Malay Archipelago, which, on account of its technical character, he proposed should be taken as read.—It was announced that at the next meeting a paper would be read by Dr. Lionel S. Beale, on "The bioplasm of man and the higher animals, and its influence in tissue formation, action and metabolism—a microscopical study."

**Zoological Society, March 21.**—Dr. W. T. Blanford, F.R.S., Vice-President, in the chair.—Mr. E. T. Newton, F.R.S., exhibited and made remarks upon some fossil remains of a Mouse from Ightham, Kent. He pointed out that the name under which he had described the specimens in 1894, viz. *Mus abbotii*, had been previously employed by Waterhouse for a Mouse from Trebizond, and that he proposed to substitute *Mus lewisi* for that name. A communication was read from Dr. G. Stewardson Brady, containing an account of the Copepoda collected, chiefly by means of the surface-net, by Mr. G. M. Thomson, of Dunedin, and by Mr. H. Suter, on behalf of the Zoological Museum of Copenhagen. It was shown that several species were identical with well-known European forms, and others were closely allied, but many were entirely distinct and presented very interesting peculiarities.—Mr. W. P. Pycraft gave an account of the osteology of the Tubinares. He pointed out the Stork-like character of the group, which had not been before emphasised, so far as regards osteological features.—Mr. F. E. Blaauw gave an account of the breeding of the Weka Rail (*Ocydromus australis*) and Snow-Goose (*Chen hyperboreus*) in his park at Gooilust, North Holland. The Rails could not, on several occasions, be induced to complete the periods of incubation, always eating the eggs after sitting for a few days. One young one was eventually hatched by placing an egg under a Bantam-hen. The Snow-Goose (a female) paired with a male Cassin's Snow-Goose (*Chen caerulescens*), and laid and hatched three eggs. The young birds, it was stated, were apparently assuming the plumage of the male parent.—Mr. W. E. de Winton read a paper on two species of Hares from British East Africa, specimens of which had been collected by Mr. Richard Crawshay. One of them, from the plains of the Upper Attie, was referred to *Lepus somalensis*, Heugl., a species which had not previously been recorded south of Somaliland. The other species from Kitwi, a short-eared form, which somewhat resembled the Nyasaland Hare (*L. whytii*), but differed in its black-tipped fur and also in its dentition, was named *L. crawshayi*, sp. nov.—A communication was read from Dr. A. G. Butler, containing an account of the Butterflies collected by Mr. Crawshay in British East Africa in 1898. Specimens of 62 species (which were enumerated in the paper) were contained in the collections, three of which were made the types of new species, viz. *Acraea astrigera*, *Scolitantides crawshayi*, and *Pyrgus machacoa*.

## CAMBRIDGE.

**Philosophical Society, March 6.**—Mr. J. Larmor, President, in the chair.—Notes on the Binney collection of Carbon-

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iferous plants. I. *Lepidophloios*, by A. C. Seward. In 1872 Binney described some unusually perfect sections, prepared from stems found in the clay-iron-stone of the Coal-Measures near Dudley, which he referred to two species, *Lepidodendron Harcourtii* Witham and *Halonia regularis* Lind. and Hutt. The specimens now form part of the Binney collection in the Woodwardian Museum. All the sections (four in number) must undoubtedly be referred to the same species, and most probably to *Lepidophloios fuliginosus* Will.—A note on the way in which bones break, by Dr. Joseph Griffiths. After describing the construction of the shaft of a long bone and pointing out that bone in the adult is hard and tough but not brittle, Dr. Griffiths showed that the long bones are adapted to resist pressure when applied from end to end, that is, in their length. He then demonstrated by means of specimens of bones he had experimentally fractured, the way in which they break on the application of a bending force, of a direct blow and of a blow on the free extremity when a portion of the other end was fixed.—On the origin of magneto-optic rotation, by J. Larmor. The object of this note is to point out that it is possible to deduce the Faraday effect from the Zeeman effect by general reasoning as regards any medium in which the optical dispersion is mainly controlled by a series of absorption bands for which the Zeeman effect obeys the above law, without its being necessary to introduce any special dynamical hypothesis. For this law ensures that the effect of the magnetic field on the periods of the corresponding free vibrations of the molecules is the same as that of a bodily rotation, say with angular velocity  $\omega$ , round its axis: while the complete circular polarisations of the Zeeman doublets, viewed in the direction of the axis, show that their states of vibration are symmetrical with respect to that axis.

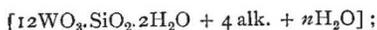
## EDINBURGH.

**Royal Society, March 6.**—Prof. McKendrick in the chair.—Prof. A. Crichton Mitchell read a paper on the convection of heat (Part i.), in which Newton's law of cooling was discussed. In most of the references to Newton's law, the circumstances under which Newton declared the law to hold are either disregarded altogether or mentioned in the vaguest way. By his own experiments on the cooling of a copper ball in a steady current of air, Prof. Mitchell found that Newton's law of cooling was accurate up to temperature differences of 100° C. in steady currents of air of as much as ten miles per hour. The stronger the current the quicker the cooling; but the discussion of the precise law connecting the two was reserved for a future communication. The results suggested the possibility of a form of anemometer, in which the speed of the wind might be measured by its cooling effect on, for example, a wire heated by a steady electric current.—Dr. Buchan presented a detailed account of the meteorology of Ben Nevis (Part ii.). Such important questions as the differences of temperature and pressure at the base and the summit of Ben Nevis were discussed, and were shown to be intimately connected with the cyclonic or anti-cyclonic conditions existing or approaching. The observed relation between pressure and height had led to an important correction to Laplace's well-known formula. When applied to the reduction to sea-level of observations in Scandinavia and other localities, the Ben Nevis empirical formula brought consistency where, with the use of Laplace's formula, there had been obvious discrepancy. In the discussion of the diurnal barometric variation, it had been found necessary to separate the cloudy and clear days; and this had suggested applying the same method to analyses of the meteorological statistics of other places. It thus appeared that the influence of cloud was to produce an evening maximum, and completely change the form of the daily barometric curve.—Dr. Hugh Marshall, in a note on polarisation phenomena observed in quantitative electrolytic determinations, mentioned that, in the case of certain solutions, the completion of the electrolysis of the metal was shown by a sudden rise in the potential difference of the electrodes. The addition of a small quantity of the metal to the solution produced an immediate fall of this potential difference to its normal value.—Dr. Noël Paton gave an account of a detailed examination of a study by Drs. Dunlop, Macadam, and himself on the influences of diphtheria toxin on the metabolism. The metabolism in simple fasting was compared with the metabolism in fasting with fever in dogs; and among the more important results obtained were these: (1) the increase in fever of the proportion of nitrogen not as urea; (2) the non-increase of the proportion of nitrogen

in ammonia; (3) the increase in the proportion of neutral sulphur, but not in the sulphur as sulphuric acid, thus explaining the non-increase of ammonia and corresponding with diminished elaboration of urea; (4) non-increase in the proportion of phosphorus as phosphates, indicating the absence of an increased decomposition of nuclein compounds; (5) no alteration in the proportion of potassium and sodium, such as has been described by Sachowski as occurring in fever in man; (6) decrease in the excretion of chlorine out of proportion to the decrease in the bases, raising the question of what acids take the place of hydrochloric acid in the urine.—Dr. Gregg Wilson, in a paper on the first foundation of the lung in *Ceratodus*, showed that the lung arises, as in amphibians and higher forms, in a mid-ventral gut in the pharynx, immediately posterior to the gill region. This expands into a considerable unpaired vesicle, which in later stages grows round the gut till it lies dorsally.—Dr. Gregg Wilson also read a paper on the embryonic excretory organs of *Ceratodus*, in which the pronephros was shown to be of amphibian type, having two nephrostomes opening directly into the anterior of the body cavity. Later there is a pronephric chamber formed, as in amphibia, by secondary fusion of the gut and body wall. Into this region of the coelom the glomerulus projects. The backward growth of the union of gut and body wall finally leads to the closing of the nephrostomes and the obliteration of the pronephric chamber.

## PARIS.

**Academy of Sciences, March 20.**—M. van Tieghem in the chair.—The President announced to the Academy the death of M. Naudin, Member of the Botanical Section.—Action of hydrogen sulphide and alkaline sulphides upon the double cyanides, by M. Berthelot. This paper contains thermochemical data for the reactions between  $\text{AgCN.KCN}$ ,  $\text{Hg(CN)}_2\text{KCN}$ ,  $\text{Zn(CN)}_2\text{KCN}$ , and hydrogen or sodium sulphides.—Maximum quantity of chlorides contained in sea air, by M. Armand Gautier. The greatest amount found was 0.022 mgr. of common salt per litre of air.—Astronomical and magnetic observations made on the eastern coast of Madagascar, by M. R. P. Colin.—Observations of the Swift comet (1899 *a*), made at the Toulouse Observatory with the 23 cm. Brunner equatorial, by M. F. Rossard.—Observations of the Swift comet (1899 *a*), made at the Observatory of Besançon by M. P. Chofardet, by M. J. Gruy.—On the lines of curvature of certain surfaces, by M. E. Blutel.—On some applications of the law of parallelism to bundles and congruences, by M. C. Guichard.—On some arithmetical properties of analytical functions, by M. Paul Staedel.—On the unsymmetrical alternating current arc between metals and carbons, by M. A. Blondel. The oscillations are given in the form of curves, fifteen of which are reproduced in the paper.—On the increase of the mean intensity of the current by the introduction of the primary of the coil, in the case of the Wehnelt electrolytic interrupter, by M. H. Pellat. In a circuit at 110 volts, containing the Wehnelt commutator but not the primary of the coil, an ammeter showed four to five amperes. The introduction of the additional resistances of the primary of the coil increased the current to twenty-five amperes, the additional impedance thus considerably increasing the mean current strength. This paradoxical result is shown to be in accordance with the known laws of induction.—On an isomer of menthoxylic acid, by M. Georges Leser.—On the electro-negative character of certain unsaturated organic radicals, by M. Ernest Charon. The propylenic group,  $\text{CH}_3\text{CH}=\text{CH}$ —has much more marked electro-negative properties than the vinyl group,  $\text{CH}_2=\text{CH}$ —.—Action of formaldehyde upon albumenoid materials. Transformation of peptones and albumoses, by M. Charles Lepierre.—Silico-tungstic acid as a reagent for alkaloids, by M. Gabriel Bertrand. The reagent proposed is  $12\text{WO}_3\text{.SiO}_2\text{.2H}_2\text{O}$ , or its sodium salt, in 5 per cent. solution. It has the advantages of giving well-defined salts, absolutely stable, the analysis of which can be made with exactitude. Its high molecular weight is also advantageous. The precipitates formed have the composition



analyses are given of the salts with pyridine, morphine, and strychnine.—Researches on the physiological value of the pyloric tubes in certain Teleostia, by M. Th. Boudourg.—An old Russian legend relating to a fall of stones, by M. Stanislas Meunier.

## GÖTTINGEN.

**Royal Society of Sciences.**—The *Nachrichten* (mathematico-physical section) part iv. for 1898, includes the following memoirs communicated to the Society:—

October 29, 1898.—W. Voigt: On the connection between the Zeeman and the Faraday effects.

November 26.—H. Ludendorff: On a remarkable property of certain equations in the theory of characteristic planets.—W. Voigt: Theory of the phenomena observed by Macaluso and Corbino. Double refraction of sodium vapour in the magnetic field at right angles to the lines of force.

## DIARY OF SOCIETIES.

WEDNESDAY, APRIL 5.

ENTOMOLOGICAL SOCIETY, at 8.

THURSDAY, APRIL 6.

LINNEAN SOCIETY, at 8.—On *Carex Wahlenbergiana*: C. B. Clarke, F.R.S.—On the Discovery and Development of Rhabdites in Cephalodiscus: F. J. Cole.

FRIDAY, APRIL 7.

GEOLOGISTS' ASSOCIATION, at 8.—The Geology of Brittany, with Special Reference to the Whitsuntide Excursion: Dr. Charles Barrois.

## BOOKS AND SERIALS RECEIVED.

BOOKS.—Die Optischen Instrumente: C. Leiss (Leipzig, Engelmann).—Kritik der Wissenschaftlichen Erkenntnis: Dr. H. v. Schoeler (Leipzig, Engelmann).—Light Railways at Home and Abroad: W. H. Cole (C. Griffin).—A Manual of Locomotive Engineering: W. F. Pettigrew and A. F. Ravenshear (C. Griffin).—Die Kontinuität der Atomverteilung: Dr. G. Hörmann (Jena, Fischer).—The New Science and Art of Arithmetic: A. Sonnenschein and H. A. Nesbitt (Sonnenschein).—Le Climat de la Belgique en 1897: A. Lancaster (Bruxelles, Hayez).—Life of Admiral Sir Wm. R. Mends: B. S. Mends (Murray).—True Tales of the Insects: L. N. Badenoch (Chapman).—Explorations in the Far North: F. Russell (Iowa).

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