

candidates for appointment to commissions will be required to obtain either a "leaving" certificate or a "qualifying" certificate. A "leaving" certificate is one including the same subjects as a qualifying certificate, and granted by a recognised body to candidates not less than seventeen years of age who have attended three years' continuous teaching, with satisfactory conduct, in a properly inspected school. A "qualifying" certificate is one covering two classes of subjects. All candidates must qualify in the subjects of class i., viz. English, English history and geography, and elementary mathematics. Candidates must qualify in two of the subjects of class ii., viz. science, French or German, Latin or Greek. The expression "science," the rules state, means so far as a leaving certificate is concerned, "such combination of experimental or natural science as the Army Council may approve, provided always that the sciences recognised shall have been taught in a sufficiently extended course, including a due amount of laboratory or field work." Any leaving certificate accepted must certify that the candidate has taken a sufficient course of elementary geometrical drawing and practical geometry, and also an elementary course of practical measurements. Leaving certificates will be accepted from the Oxford and Cambridge University examining bodies, the University of London, the Scottish Education Department, and such universities in Great Britain as undertake to issue a certificate satisfying the required conditions. The same bodies will hold examinations periodically at which candidates who desire to obtain qualifying certificates may present themselves.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, March 3.—"The Spectra of Antarian Stars in Relation to the Fluted Spectrum of Titanium." By A. Fowler, A.R.C.S., F.R.A.S.

The distinguishing feature of the spectra of the Antarian stars (Secchi's third type) is the system of apparently dark flutings, sharp towards the violet and fading off towards the red end of the spectrum. The principal flutings are well seen in Antares, but they are more strongly developed in the spectra of α Herculis and α Ceti, in which stars additional details are also seen. These flutings have not hitherto received a definite chemical interpretation, and it has been uncertain, owing to the possibly misleading effects of contrast, whether the spectrum was to be regarded as one consisting wholly of absorption flutings fading towards the red, or as one partly consisting of emission flutings fading in the opposite direction.

The purpose of the present communication is to state the nature of the evidence which indicates that the spectrum is essentially an absorption spectrum, and that the chief substance concerned in the production of the flutings is titanium, or possibly a compound of that element with oxygen.

The flutings in question come out in the arc spectrum of titanium oxide, if the precaution be taken to provide a liberal supply of material and to use a very long arc, taking care also that the image of the "flame" is projected on the slit of the spectrocope. They are also seen in the arc spectrum of the chloride under similar conditions. Numerous lines accompany the flutings produced in this manner, and some of the details are consequently masked or not recognised without careful study of the photographs. So far the flutings have not been very successfully produced in the oxyhydrogen flame; they are visible in the flame spectrum of the fumes from the chloride, but their observation is difficult on account of the bright continuous spectrum. The best representation of the flutings has been obtained by passing a spark, without jar, through the fumes of oxychloride which rise from the chloride of titanium on exposure to air. In these circumstances the lines which appear are not numerous, and some of the secondary flutings which are masked by lines in the spectrum of the flame of the arc are readily detected, in spite of the continuous spectrum which is also present.

The wave-lengths of the heads of the principal flutings are 6162.5, 5604.5, 5447.0, 5241.0, 5167.5, 4955.1, 4761.6 and 4584.3, and it is found that these agree within the

possible limits of error with eight of the ten principal bands recorded in the stars by Vogel and Dunér.

The origin of the two outstanding bands at 5862 and 6493 has not yet been ascertained, but in the case of the remaining flutings the evidence for titanium is enormously strengthened by a discussion of their structure and by extending the comparison further into the violet. Photographs of the stellar spectra, especially those of α Ceti and α Herculis, show that some of the principal flutings are composite, Dunér's band 10, for example, containing, according to Sidgreaves, four distinct flutings separated by intervals of about 44 tenth-metres, each of which is weaker than the one which precedes it on the more refrangible side. A precisely similar structure is found in the case of the titanium flutings, and a comparison of wave-lengths indicates that the various components occupy the same positions as those in the stars, so far as the available measurements permit the test to be applied.

The table of wave-lengths given in the paper shows that the details of the titanium flutings are reproduced with remarkable fidelity in the stellar spectra, and more especially in α Ceti. There is some uncertainty in connection with the complicated groups of flutings and lines extending from 5598 to D, which need further investigation in the stellar spectra with instruments of greater dispersion, but the general agreement is such as to leave no reasonable doubt that titanium is the main factor in the production of the dark flutings which characterise the Antarian group of stars.

This explanation of the dark flutings suggests that the appearance of bright flutings in the Antarian spectrum arises chiefly from effects of contrast. It does not, of course, exclude the possibility of the presence of bright flutings, such as might be indicated by local brightenings which are not exactly in coincidence with the edges of dark flutings.

"An Inquiry into the Nature of the Relationship between Sun-spot Frequency and Terrestrial Magnetism." By C. Chree, Sc.D., LL.D., F.R.S.

(1) The formula

$$R = a + bS \dots\dots\dots (1),$$

where R is some magnetic quantity such as the amplitude of the diurnal oscillation of the needle, a and b constants, and S sun-spot frequency (after Wolf and Wolfer), was first applied by Wolf to the mean declination range throughout the year.

The present paper is entirely devoted to the connection between sun-spot frequency and terrestrial magnetism. It deals with data from Milan (1836-1901), Greenwich (1841-96), Pawlowsk and Katharinenburg (1890-1900), Batavia (1887-98), and Mauritius (1875-90). It aims at ascertaining wherein the results in my previous paper (*Phil. Trans.*, A, vol. ccii. p. 335) are peculiar to the station or period dealt with.

It investigates what differences may exist between the sun-spot connection on ordinary days and on magnetically quiet days, and what differences arise when one applies (1) to the mean of the differences between the absolutely highest and lowest daily readings, instead of to the range of the mean diurnal inequality. It also considers various measures of the magnetically disturbed character of the year, and their relation to sun-spot frequency.

There seems a general tendency for b/a to increase as we pass from a quantity, such as the range of a diurnal inequality, which is comparatively independent of disturbances, to a quantity such as the mean absolute daily range which is largely dependent on disturbances. Formula (1) becomes, however, less and less strictly applicable, the more disturbed the magnetic quantity to which it is applied. When we consider quantities such as the mean of the twelve monthly ranges (maximum and minimum for the month), or the annual range (maximum and minimum for the year), we find large differences between observed values and those calculated from (1).

In the case of ranges from mean diurnal inequalities for the year, the agreement between observed and calculated values is about equally good at Pawlowsk, Katharinenburg, Batavia, and Kew. In the case of declination, the mean difference between observed and calculated values is about

4 per cent. of the mean value of the range during the period dealt with. On the whole, the agreement is distinctly less good in the case of vertical force than in the case of declination, inclination or horizontal force.

March 17.—“On the Construction of some Mercury Standards of Resistance, with a Determination of the Temperature Coefficient of Resistance of Mercury.” By F. E. Smith, A.R.C.Sc., Assistant at the National Physical Laboratory. Communicated by R. T. Glazebrook, M.A., F.R.S.

This paper contains an account of the construction and measurement of eleven mercury standards of resistance at the National Physical Laboratory.

A comparison between the international ohm as realised from these standards and the unit of resistance derived from the coils belonging to the British Association shows that

$$\left. \begin{array}{l} \text{Resistance of 1 int. ohm} \\ \text{(as realised at the N.P.L.)} \end{array} \right\} \left\{ \begin{array}{l} \text{Resistance of unit derived from} \\ \text{B.A. coils (assumed as equal} \\ \text{to } 10^9 \text{ C.G.S. units)} \end{array} \right. \\ = 0.00008_3 \text{ ohm.}$$

A very concordant series of observations also indicates that

$$\left. \begin{array}{l} \text{Resistance of 1 int. ohm} \\ \text{(as realised at the Reichs-} \\ \text{anstalt)} \end{array} \right\} \left\{ \begin{array}{l} \text{Resistance of 1 int. ohm (as} \\ \text{realised at the N.P.L.)} \end{array} \right. \\ = 0.00002_0 \text{ ohm.}$$

The methods adopted both for the construction and evaluation of the mercury standards are very different from those which have been previously employed, one of the methods of erection enabling the “end effect” of the tubes to be eliminated. Owing to the increasing accuracy of electrical measurements, it was thought desirable to realise the international ohm with a probable error not exceeding one part in one hundred thousand. The results obtained with the eleven mercury standards of resistance are in very close agreement, the calculated probable error of the determinations being ± 0.0008 per cent. only.

The temperature coefficients of resistance of (1) mercury in Jena 16^{mm} glass, of (2) mercury in verre dur glass, and of (3) a constant volume of mercury, have also been determined for a range of temperature 0° C. to 22° C. The results are as follows:—

(1) Mercury in Jena 16^{mm} glass,

$$R_T = R_0[1 + 0.00088018T + 0.00000105793T^2].$$

(2) Mercury in verre dur glass,

$$R_T = R_0[1 + 0.00088036T + 0.00000103094T^2].$$

(3) A constant volume of mercury,

Deduced from (1),

$$R_T = R_0[1 + 0.00088788T + 0.0000010564T^2].$$

Deduced from (2),

$$R_T = R_0[1 + 0.00088776T + 0.0000010376T^2].$$

T being the temperature on the hydrogen scale.

“The Specific Heats of Metals and the Relation of Specific Heat to Atomic Weight. Part iii.” By Prof. W. A. Tilden, F.R.S.

The object of the experiments, of which an account is given in this paper, was to determine whether the atomic heats of the elements entering into combination are preserved in the compound at all temperatures, previous results obtained by the author and others having shown that the specific heats of metals of small atomic weight, such as aluminium, increase very rapidly with rise of temperature.

As it is not possible to determine the specific heat of sulphur throughout a long range of temperature, tellurium was chosen for experiment. Compounds of tin, silver and nickel with tellurium were prepared, and two alloys of silver and aluminium. The average specific heats of all these elements, except tin, which melts at 232° C., were determined over various intervals from the boiling point of liquid oxygen to nearly 500° C. in the case of the less fusible elements, a range of about 680° C. From these mean specific heats the true specific heats at intervals, of 100° C. absolute temperature were calculated, and from

the specific heats the atomic heats were deduced. The mean specific heats of the compounds, formed by their union, were also determined, and from these data the molecular heats of the compounds calculated. On comparing the sum of the atomic heats of the elements present with the molecular heat of the compound at the successive temperatures, it was found that there is throughout a close concordance. The order of difference may be shown by one example:—

Nickel Telluride, NiTe.

Temperature, absolute	Sum of atomic heat of Ni and Te	Molecular heat of NiTe
100° ...	9.20 ...	8.38
200° ...	11.08 ...	11.35
300° ...	12.22 ...	12.41
400° ...	13.00 ...	12.92
500° ...	13.49 ...	13.15
600° ...	13.85 ...	13.28
700° ...	14.11 ...	13.35

The results of these experiments show that Neumann's law is approximately true, not only at temperatures from 0° to 100° C., but at all temperatures. They thus support the view that the specific heat of a solid is determined by the nature of the atoms composing the physical molecules, and is not a measure of the work done in thermal expansion.

The paper concludes with a discussion of the relations of specific heat to atomic weight under different physical conditions, that is, in the solid, liquid and gaseous states.

Entomological Society, March 2.—Prof. E. B. Poulton, F.R.S., president, in the chair.—Commander J. J. Walker, R.N., exhibited (1) *Hecatesia fenestrata*, Bdv., an interesting Australian moth, the ♂ possessed of a very marked power of stridulation (stridulating organ on longitudinal transparent bar on fore-wing), known in New South Wales as the “whistling moth”; (2) *Dodonidia helmsi*, Butler, a rare satyrid butterfly from New Zealand; and (3) a gigantic species of the Thysanurid genus *Japyx*, found at Picton, New Zealand.—Mr. C. O. Waterhouse exhibited and commented upon a diagram of the mouth of one of the Mallophaga (*Laemobothrium titan*).—Mr. G. C. Champion exhibited specimens of the two species of Dorcadion found during his recent journey in Spain, *D. almarzense*, Esc.? from the summit of Montcayo, and *D. neilense*, Esc., from the Sierra de Logroño. He also exhibited numerous examples of *Pyropsyche moncaunella*, Chapm., found by Dr. Chapman and himself on Montcayo.—Mr. A. J. Chitty, Mr. Jennings and other fellows exhibited specimens of the genus *Tropiphorus* to determine if possible whether *T. tomentosus* and *T. obtusus* were in reality one and the same species. Various cases of coincident localities for the species were quoted, and it was the general opinion that in the United Kingdom the two were but forms of one species.—Dr. F. A. Dixey read a note on the so-called “bugong” moth consumed by some Australian natives for food. He said it was not a *Euplœa* at all, as supposed by Kirby in his “Bridgwater Treatise,” but a *Euxoa*, and not a butterfly as also stated by Westwood.—The President exhibited a specimen of a beetle, *Glenea pulchella* (Thoms.), one of three individuals of the species taken in the Nilgiris by Mr. Leslie Andrewes, which clearly mimics a large ichneumon fly not yet identified.—Mr. L. B. Prout exhibited, on behalf of Mr. A. Bacot, long bred series of *Triphaena comes*, Hb., the result of breeding for two generations from a wild ♀ of the *curtisii* form, taken near Forres. In the first generation, rather more than half the progeny followed, to a certain extent, the parent ♀, though varying from rich deep red to almost black. Pairings of these dark specimens resulted in a brood in which the percentage of ab. *curtisii* was slightly increased, although the type forms were still well represented; but it was noticeable that in every specimen the orbicular stigma was filled up with the darker or melanic colour.—*Papers*:—Notes on Australian and Tasmanian Cryptocephalides, with descriptions of new species: A. M. Lea.—A revision of the subfamily Pelidnotinæ of the coleopterous family Rutelidæ, with descriptions of new genera and species, by the late F. Bates.—On some new species of eastern Australian and African moths in the British Museum: Colonel Charles Swinhoe.—An entomological excursion to Montcayo, Spain, with some remarks on the

habits of *Xyleborus dispar*, Fabr., by Dr. Thomas Algernon Chapman: G. C. **Champion**.—Further notes on Hydroptilidæ belonging to the European fauna, with descriptions of new species: K. J. **Morton**.—A note on *Elymnias bornienseis*, Wallace: R. **Shelford**.—A discussion on "What is a Species?" was opened by the Rev. F. D. Morice, in which Mr. H. J. Elwes, Prof. F. A. Dixey, Mr. A. J. Chitty, Mr. W. E. Sharp, the president, and other fellows joined.

Geological Society, March 9.—Dr. J. E. Ma. F.R.S., president, in the chair.—On the probable occurrence of an Eocene outlier off the Cornish Coast: Clement **Reid**, F.R.S., communicated by permission of the director of H.M. Geological Survey. The evidence suggests that, underlying the western part of the English Channel, an Eocene basin may occur comparable in importance with that of Hampshire.—The Valley of the Teign: A. J. **Jukes-Browne**. The Teign Valley is not a transverse valley preserving a general direction in spite of opposing ridges, nor is it a longitudinal valley running parallel to a dominant ridge, nor is it a simple combination of one with the other, as often happens; but it apparently consists of parts of two transverse valleys linked by a longitudinal one. The Teign runs off Dartmoor through a gorge which takes an easterly direction, as if it were going to join the Exe; it is then deflected southward into what, with respect to the Permian escarpment, is a longitudinal valley; this ends in a low-lying plain, and from this plain it escapes eastward to the sea through a transverse valley, which has been cut across the ridge of Permian and Cretaceous rocks. The theory of the capture of one river by another furnishes an intelligible explanation of the facts when applied to the course of the Teign. The author thinks that some other river-courses and geographical features in Devon can be explained on the theory of an easterly incline modified by a subsequent southerly tilt.

Physical Society, March 11.—Dr. R. T. Glazebrook, F.R.S., president, in the chair.—The whirling and transverse vibrations of shafts: Dr. **Chree**. The paper shows how the mathematical results obtained by Prof. Dunkerley can be derived by a less cumbrous treatment, and how in many instances they admit of great simplification, without sensible loss of accuracy. It is also shown how loaded shafts can be dealt with, without recourse to the hypothesis presented by Dunkerley; at the same time some light is thrown on the relation of this hypothesis to theory. Six main cases are considered, in which the shaft is variously supported; in some of them numerical results are deduced for comparison with Dunkerley's experiments.—Notes on non-homocentric pencils, and the shadows produced by them, part ii., shadows produced by axially symmetrical pencils possessing spherical aberration: W. **Bennett**. This paper deals with the shadows obtained by interposing a straight wire near the focus of a pencil proceeding from a lens or mirror uncorrected for spherical aberration. A method is described for drawing sections of the wave-front in the neighbourhood of the focus. A simple physical explanation of the shadows is given by means of the wave-fronts; it is shown that the real shadow consists in general of two branches, one closed and the other open, with a ϕ -form as a symmetrical special case. The equations of the wave-front are worked out for the special case of the reflection of a plane wave at a spherical mirror, and a method of drawing the shadow-forms is described.

Linnean Society, March 17.—Prof. J. Bretland Farmer, F.R.S., vice-president, in the chair.—An account of the Bryozoa from Franz-Josef Land, collected by the Jackson-Harmsworth Expedition, 1896, 1897 (part ii., Cyclostomata, Ctenostomata, and Endoprocta): A. W. **Waters**. Mr. Waters comments on the confusion that has arisen from attempts to base a classification of the Cyclostomata on almost valueless characters taken from fossils. The bipolar theory of distribution, in his opinion, receives little support from the Bryozoa, in several instances species that are distinct having been united, and in the comparison of opposite areas the terms Arctic and Antarctic not having been used with similar strictness.—Botanic illustration from the fifteenth to the twentieth centuries: B. Daydon **Jackson**.

CAMBRIDGE.

Philosophical Society, February 29.—Dr. Baker, president, in the chair.—On decomposition of hydrogen dioxide under the influence of radium bromide: H. J. H. **Fenton**. These experiments were originally undertaken with the object of studying the conditions of stability in aqueous solutions of pure hydrogen dioxide at the ordinary temperature in absence of light. The observations have been extended so as to include an investigation of the influence exerted by rays from the latter substance on the decomposition of the dioxide. It has been shown by Bredig and his colleagues that the rate of decomposition of hydrogen dioxide under the influence of catalysers, such as colloidal platinum, and in presence of many electrolytes and non-electrolytes, follows the law for a reaction of the first order; in the case of the pure dioxide alone, however, under the influence of platinum, the change is not strictly in accordance with this law, the value of the constant increasing as the concentration of the dioxide becomes smaller. Similar results are obtained in the present instance when the aqueous solution undergoes decomposition either alone or under the influence of radium rays. In the latter case, however, the change is greatly accelerated, the value of the constant in each case being approximately double that calculated from the parallel blank experiment. Further experiments are in progress with the object of ascertaining whether the oxidation of organic substances, either alone or in presence of iron, is influenced by radium.—Exhibition of oribatid mites taken in the neighbourhood of Cambridge: C. **Warburton** and N. D. F. **Pearco**. The Acari have received little attention in this country, and this is the first attempt to investigate the local fauna of any acarine group. In four winter months specimens of forty-seven out of the hundred known British species have been taken in the neighbourhood of Cambridge, and every one of the fifteen British genera is locally represented.—Some observations on the determination of sex in plants: R. P. **Gregory**. The work was carried on in response to Castle's suggestion that sex may be a character inherited in accordance with the Mendelian principles of segregation and dominance. The problem is rendered more complex in plants owing to the occurrence of two distinct generations (the sporophyte and the gametophyte) which regularly alternate in the life-history of the plant. In the flowering plants the alternation is masked by the complete dependence of the gametophyte upon the sporophyte; but in the ferns this is not the case; this group was therefore chosen as the subject for investigation. From the observations it appears that sex in the sporophyte is homologous with that in animals, and may perhaps be inherited in accordance with Mendelian principles. It is to be distinguished from sex (as manifested by the production of antherozoids or of ova) in the gametophyte, the latter being determined by the conditions of nutrition.—On variation in the number and arrangement of the male genital apertures, and on the relative proportion of the sexes, in the Norway lobster (*Nephrops norvegicus*): D. C. **McIntosh**. The results are given of an examination of 656 specimens obtained from the Firth of Clyde. The percentage having an abnormal number of genital apertures was 2.49, or considerably lower than that recorded by Marshall for the Norway lobsters from the Firth of Forth. Among the Clyde specimens the sexes occurred in approximately equal proportions, the females on an average being of considerably smaller size than the males.—On the boiling points of homologous compounds: H. **Ramago**. The relation of boiling point to molecular weight has been studied by means of diagrams drawn with the former as abscissæ and the latter as ordinates. These indicate that Walker's formula for the ten paraffins C_7H_{16} to $C_{16}H_{34}$ only applies to the CH_2 linkage in the molecules, and that the influence of the terminal hydrogen atoms is either a constant in these higher members of the series or it is so small it may be disregarded. The influence of the terminal atoms increases as the chain shortens, and Walker's formula does not, on this account, apply to the lower members. This view has led to a modification which includes all the series up to $C_{16}H_{34}$. The new formula is $T = a\{M(1-2^{-n})\}^{\frac{1}{2}}$, in which T is the boiling point in absolute degrees, a is a number depending on the pressure, M is the molecular weight, and n the number of carbon atoms in the molecule.

PARIS.

Academy of Sciences, March 21.—M. Mascart in the chair.—On hypoabelian groups: Camille **Jordan**.—New researches on the density of fluorine: Henri **Moissan** (see p. 520).—On an African trypanosome, pathogenic for horses: A. **Laveran** and F. **Mesnil**. In the course of their researches on human trypanosomiasis, Messrs. Dutton and Todd have discovered a new trypanosome which is pathogenic to horses, and to which they give the name of *Tr. dimorphon*. A comparison of this trypanosome with *Tr. gambiense* shows that the two species are morphologically distinct. That they are distinct species is also shown by the fact that animals which have acquired immunity for *Tr. gambiense* are still sensible to *Tr. dimorphon*; human serum, which is without action upon *Tr. gambiense*, has a feeble but distinct action upon the other species. The general conclusions of Dutton and Todd are confirmed.—On some formulæ useful in discussing the stability of a vitreous medium: P. **Duhem**.—On the general conditions and unity of formation of combustible minerals of all ages and of all species: M. **Grand'Eury**. The author regards all Coal-measures, of whatever epoch, as being formed under water in a similar manner by the débris of marshy vegetation.—On forms decomposable into linear factors: F. **Hocevar**.—The law of disappearance of the activity induced by radium after heating the substances rendered active: P. **Curie** and J. **Danne**. Plates of platinum, which had been exposed for some time to the action of radium, were heated to different temperatures, and the rate of loss of activity studied at the room temperature. The curves, taking time as the abscissæ and the logarithm of the intensity of radiation as the ordinates, become linear at the higher temperatures.—The study and comparison of the methods of reduction of magnetic hysteresis: Ch. **Moureu**. The hysteresis may be suppressed by the action of an oscillating magnetic field.—The action of magnetism on phosphorescence: Alex. **de Hemptinne**. All phosphorescent substances do not appear to be equally susceptible to the action of a magnetic field.—The application of the electric spark to the chronophotography of rapid movements: Lucien **Bull**. An instrument is described which is capable of taking 1500 images per second.—The study of colloidal solutions: Victor **Henri** and André **Mayer**. It has been generally held that the phase rule cannot serve as a guide in the case of colloidal solutions. The author holds that the phase rule may be applied to the systematic study of the precipitation of colloids whenever the phenomena of precipitation are reversible.—The transformation of oxides and oxygenated salts into chlorides: C. **Matignon** and F. **Bourion**. Further applications are given of the use of a mixture of chlorine and sulphur chloride in the preparation of anhydrous chlorides. The substances studied include tungstic acid, chromic and ferric oxides, the oxides of nickel and cobalt, zinc, manganese and tin, boric anhydride and the sulphates of barium and calcium. In the last two cases the transformation is so complete that the reaction may serve as the basis of a quantitative method.—The lead and silver salts of the monoalkylphosphoric acids: J. **Cavalier**.—Arnisterine, the phytosterine of *Arnica montana*: T. **Klobb**.—On some aminoalcohols with alcoholic function of the type $R.C(OH)(CH_3).CH_2.N(CH_3)_2$: E. **Fourneau**.—*Hyphoene coriacea*, the textile palm of Madagascar: Pascal **Claverie**.—On the persistence of alternate structure in some Labiates: G. **Chauveaud**.—Specific action of some parts of the body on certain phosphorescent screens: Augustin **Charpentier**.—On the colour reactions resulting from the action of tyrosinase: C. **Gessard**.—On the presence of an apparatus for accommodation in the compound eyes of certain insects: Pierre **Vigier**. Proofs are given of the existence in the compound eyes of *Aeschna* of a real accommodation apparatus, allowing of the adaptation of the sight to different distances.—Study of the law of action of maltase. The influence of the concentration of the maltose: E. F. **Terroine**. The influence of the concentration of the maltose is similar to the cases of invertine, emulsin, amylase and trypsin.—Studies on the action of maltase. The constancy of the ferment: Mlle. Ch. **Philoche**. When maltase from Taka diastase is allowed to act at 40° C. the activity of the ferment undergoes no appreciable change in the first twenty-four hours.—On the

duration of the treatment of arterial hypertension in arteriosclerosis by d'Arsonvalisation: A. **Moutier**. Under appropriate diet, the arterial tension in patients suffering from arteriosclerosis can be rapidly reduced to the normal by the use of high frequency currents.—The action of metals in the colloidal state and of artificial oxidases on the evolution of infectious diseases: Albert **Robin** and G. **Bardet**.—The action of formic acid on the muscular system: E. **Clement**. Sodium formate increases the muscular power and also the resistance to fatigue to a marked extent.—The fusion of ice by electricity, and the application of this principle to navigation in Arctic seas: F. Romanet **du Caillaud**.

DIARY OF SOCIETIES.

TUESDAY, APRIL 5.

NATIONAL ASSOCIATION OF MANUAL TRAINING TEACHERS.—Annual Conference at Hastings, at 3.—The Psychological Importance of Manual Training: Sir John Cockburn.

THURSDAY, APRIL 7.

LINNEAN SOCIETY, at 8.—The Morphology and Anatomy of the Stem of the Genus *Lycopodium*: C. E. Jones.

RÖNTGEN SOCIETY, at 8.30.—Exhibition Evening.

FRIDAY, APRIL 8.

GEOLOGISTS' ASSOCIATION, at 8.—On the Metamorphism of Sediments: G. Barrow.

MALACOLOGICAL SOCIETY, at 8.—Description of apparently New Species of *Corbicula*, *Melania*, *Vivipara* and *Lagochilus* from Java: Rev. R. Ashington Bullen.—The Hawaiian species of *Opes*: E. R. Sykes.—On some Non-marine Hawaiian Mollusca: C. F. Ancey.—Description of a New Species of *Ancilla* from New Zealand: Rev. W. H. Webster.—Report on a Small Collection of Helicoids from British New Guinea, with Description of a New Species: G. K. Gude.

ROYAL ASTRONOMICAL SOCIETY, at 5.

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