

observed—much more requires to be known regarding the circulation of the atmosphere in high southern latitudes. There are no other portions of our globe, excepting equatorial regions themselves, which influence so greatly the climate of the southern hemisphere than the Antarctic continent. It is a vast refrigerator condensing warm moist overhead currents from the equator and speeding them back at sea-level, frequently with hurricane velocity, much to the consternation of Australian shipping. All such irregularities in the regular anticyclonic cycle can be predicted by an observing station on the coast of Antarctica, southward of Australia. That the regular phases of barometric pressure in the Antarctic regions are the dominating causes that affect the climates of the southern temperate regions cannot be denied, and by their study we shall become more capable of predicting weather for Australia.

It is very desirable that a permanent meteorological station in connection with Australia and New Zealand be erected either at Adolie Land or to the west of it.

#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

**BIRMINGHAM.**—As an outcome of the recent increase in rate aid granted by the City Council, the University has drawn up a scheme for bringing facilities for higher education within the reach of the poorest scholars who may have the requisite ability. Twelve entrance scholarships, tenable for four years, are offered for competition at the forthcoming matriculation and intermediate examinations in July and June respectively. Candidates must have been resident within the city boundaries for at least one year, and must have attended one of the schools in that area. Competitors must reach such a standard as, in the opinion of the University, offers a reasonable prospect of a successful or distinguished career. Competitors may further apply for an annual grant (not exceeding 30*l.*) towards maintenance, on the ground that they are unable to avail themselves of such scholarships without a maintenance grant in addition. It will be interesting to see to what extent the maintenance grants increase the number of suitable candidates, for hitherto the number of entrance scholarships has been in excess of the number of properly qualified applicants.

It is officially announced that Dr. Theobald Smith will be the Harvard exchange professor at Berlin University during the academic year of 1911-12. Dr. Smith has held in succession the chairs of applied zoology and comparative pathology at Harvard, and is a member of the board of directors of the Rockefeller Institute for Medical Research.

The Council of the City and Guilds of London Institute has elected Dr. E. Frankland Armstrong a fellow of the institute (F.C.G.I.), in recognition of his original research work and his contribution to the advancement of the industry, in which he has been engaged since he gained the associateship of the institute at the close of his regular course at the City and Guilds Central Technical College in 1903.

The University Extension Board of the University of London has arranged a training course for lecturers to be delivered in the University buildings, South Kensington, in the Easter term. The course will consist of four lectures by Prof. John Adams on "The Art of Lecturing," four lectures by Dr. H. H. Hulbert on "The Delivery of Lectures," and six meetings for practical work. Each member of the class will have an opportunity of delivering a trial lecture, and will have the advantage of the criticism of Prof. Adams as regards material and arrangement, and by Dr. Hulbert as regards delivery.

#### SOCIETIES AND ACADEMIES.

LONDON.

**Royal Society** April 6.—Sir Archibald Geikie, K.C.B., president, in the chair.—Hon. R. J. Strutt: The Bakerian lecture. A chemically active modification of nitrogen produced by the electric discharge. The leading facts established are:—(1) That pure nitrogen, from whatever source, subjected at a low pressure to the jar discharge, undergoes some modification which causes it to

glow for a short time after it has been sucked away from the discharge. (2) The glow which is emitted while the gas returns to its normal condition is not destroyed by the removal of ions. It is weakened by heating, intensified by cooling. This seems to favour the view that it is due to the recombination of dissociated atoms. (3) The modified nitrogen acts on ordinary phosphorus, combining with it, and at the same time forming much red phosphorus. (4) It combines with sodium and also with mercury at a gentle heat (say 150° C.), forming in the latter case an explosive compound, and in each case developing the line spectrum of the metal concerned. It also develops the line spectra of other metals, probably combining with them. (5) It develops the band spectra of compounds, when these are vaporised in it, giving in many cases spectra of substances too unstable to be examined at the temperature of the Bunsen flame. (6) It attacks acetylene, and substances like ethyl iodide or chloroform, setting the halogen free when there is one, and combining with the carbon to form cyanogen. This is proved by the brilliant cyanogen spectrum produced, and by direct chemical tests, such as formation of Prussian blue. (7) It attacks nitric oxide, with formation, strangely enough, of nitrogen peroxide, a more oxidised substance.

—A. Holmes: The association of lead with uranium in rock-minerals, and its application to the measurement of geological time.—Prof. E. T. Whittaker: The dynamical value of the molecular systems which emit spectra of the banded type. It is now widely believed that when the spectrum emitted by a luminous body is of the banded type, the small vibrators which give rise to the radiation are the molecules of the substance, as distinguished from atoms or ions. This result is applied in the main body of the paper in order to suggest a dynamical system, which is formed of two members in the same way as a diatomic molecule may be supposed to be formed of two atoms, and which has free periods of vibration related to each other by the same formula as holds in the case of banded spectra. This formula presents a certain peculiarity, in that the frequency of vibration occurs in it linearly, whereas in the equation for determining the free periods of dynamical systems in general the frequency enters by its square. It is shown that from this peculiarity in the radiation of a molecule certain inferences may be drawn regarding the dynamical character of the connection between the atoms within the molecule. It is shown that a somewhat modified mechanism would emit radiations connected by the same law as that which Balmer found for the hydrogen lines.

**Royal Meteorological Society**, March 15.—Dr. H. N. Dickson, president, in the chair.—Prof. H. H. Turner: What can we learn from rainfall records? The "periodogram" method has been applied under the superintendence of Prof. Schuster and the lecturer to the rainfall records of Padua (175 years) and Greenwich (90 years), besides Klagenfurt and Oxford (50 years), all periods between 20 months and 5 months having been examined, as well as some others. The resulting indications are not very positive, but include several features well worth further study, especially in the Greenwich rainfall, where periodicities of 597 days and 150 days (possibly a quarter of the former) seem to be fairly persistent, as well as a short one of 25 days; but these are not reproduced in the Padua records, at any rate not exactly. There are doubtful periods of 591 days and 147 days, which again are possibly related by the ratio 4 to 1. (The shorter periods near 25 days have not been investigated, as daily records are required.) It is possible that the periodicities change slowly with the latitude, in a manner suggested by the cloud belts on Jupiter.

**Geological Society**, March 22.—Prof. W. W. Watts, F.R.S., president, in the chair.—Dr. A. S. Woodward: Some mammalian teeth from the Wealden of Hastings. Mr. Charles Dawson has obtained two imperfect molars, apparently of *Plagiaulax*, from beds of grit in the Wealden near Hastings, and his associates in the work of exploration, Messrs. P. Teilhard de Chardin and Félix Pelletier, have found a well-preserved multituberculate molar of the form named *Dipriodon* by Marsh. These specimens are described.—A. Wade: Some observations on the Eastern Desert of Egypt, with considerations bearing upon the

origin of the British Trias. Phenomena observed in the Eastern Desert of Egypt, bordering the Gulf of Suez, are described. The origin of the mounds of igneous débris which flank the coastal hill-ranges is discussed. The distances to which fragments of igneous rock derived from these hills have travelled in Egypt are shown. The shore-sands are dealt with, and their origin ascribed to the breaking down of local rocks. In the marly beds connected with the shore-deposits, tiny dolomite-rhombs, similar to those found by Dr. Cullis in the Keuper Marls, are present. Some effects of wind-blown sand are detailed. The alteration of the calcium carbonate in recent shell-beds to gypsum is noted, and its significance with regard to the origin of gypsum-beds is pointed out. The characters of the massive older gypsum- and rock-salt deposits are described, together with the distribution and lithological changes in the beds when traced across the area. The origin of the gypsum series is connected with inland salt-lake conditions, and the evidence suggests that these conditions were contemporaneous with the Oligocene continental period in Egypt, and with the formation of the beds of the Fayûm in the Western Desert.—H. Bolton: Faunal horizons in the Bristol coalfield. The existence of faunal horizons at the collieries in the Bristol and Gloucestershire area, and in the Radstock area, has been determined. A measured section has been examined in detail, and four faunal horizons discovered. In every case the fauna was marine in character, and the series are all characterised by a fauna agreeing with the typical fauna of the Lower Coal Measures of the coal-fields of the Midlands, and of Lancashire and Yorkshire. Species of Carbonicola are rare, while the cephalopod and fish fauna is poor. The second series of the Upper Coal Measures has yielded *Lingula mytiloides*, several species of ostracods, four species of Anthracomya, and scales of *Strepsodus sauroides*. *Coelacanthus elegans* has been found in the first series. In the Bristol coalfield the marine fauna undergoes no marked change in its upward range. Insect-wings referred to the genus *Genetomum* have been found at one horizon, while the rare phyllopod, *Leaia leidyii*, var. *salleriana*, hitherto only known from the Lower Carboniferous of Fifeshire, was found in abundance. The total number of species now recorded from the Bristol coalfield amounts to seventy-four.

**Mineralogical Society, March 21.**—Prof. W. J. Lewis, F.R.S., president, in the chair.—Prof. W. J. Lewis: Mr. Solly's observation of wiltshireite in 1903. Wiltshireite is identical with the mineral which Mr. Solly exhibited and described before the society, November 17, 1903, and subsequently named rathite  $\alpha$ , but of which no complete description has yet been published.—R. H. Solly: Two new minerals from the Binnenthal, Switzerland. Both are probably sulpharsenites of lead, being lead-grey in colour and giving a chocolate-coloured streak; one, which is rhombohedral-diploheral, and has an angle  $111:100=38^{\circ}18'$ , is probably isomorphous with trechmannite, while the other may be orthorhombic, the angle  $100:110$  being  $58^{\circ}18'$ , but no measurable end faces were observed.—J. B. Scrivener: Notes on cassiterite in the Malay Peninsula. Cassiterite from a mine at Gopeng contains ilmenite and magnetite, and is attracted by the magnet; it also occurs mixed with tourmaline pseudomorphic after an hexagonal mineral, probably quartz.—Arthur Russell: Notes on the occurrence of dundasite in Derbyshire and co. Galway, and of bertrandite in Cornwall. Dundasite was discovered at Mill Close mine, Wensley, Derbyshire, as snow-white spheres associated with greenockite, fluor, cerussite, calamine, &c., and at Clements lead mine, Carrowgarriff, near Maam, co. Galway, associated with allophane and cerussite, and bertrandite was found in platy crystals on old specimens of blende from Wheal Vor, Breage, Cornwall, and as trillings; measuring up to 4 mm. in length, on a specimen from Wheal Metal, Breage, Cornwall, which had been presented as albite to the British Museum in 1870; in the latter case the crystals were similar to those from Pisek, Bohemia, described by C. Vrba.—Dr. J. Drugman: Quartz-twinning. The possible varieties of twinning of quartz were discussed, with special reference to the rhombohedron type, a specimen of which was exhibited.—T. V. Barker: Crystallographic notes. Two new forms found on crystals of inosite confirm the hypohexagonal type of

symmetry suggested by Fedorow. The rhombohedral modification of potassium nitrate, unlike sodium nitrate, does not arrange itself regularly when deposited on a cleavage piece of calcite; the crystals are very unstable, and rapidly pass into the ordinary orthorhombic form. A parallel growth of calcium chromate on the isomorphous mineral gypsum was obtained. New forms have been observed on urea nitrate which enabled the axial ratio  $b:c$  for the first time to be calculated; the crystals have large birefringence, and, when grown in a drop, are nearly always twinned.

**Physical Society, March 24.**—Prof. H. L. Callendar F.R.S., president, in the chair.—Dr. H. F. Haworth: (1) A sensitive thermo-regulator; (2) experiments on the measurement of electrolytic resistance using alternating currents. The "thermo-regulator" consists of a toluene thermometer with mercury platinum contacts in a capillary tube; these contacts operate, through a Siemens telegraph relay, an electromagnet switch, which cuts in or out the heating circuit. On account of the very small current required to operate the relay, a fine capillary may be used, so ensuring a high magnification with low thermal capacity. Experiments were also shown illustrating the ease with which a bridge containing an electrolytic cell could be balanced by placing a variable self-induction in series with the cell and adjusting it and the resistance of the bridge simultaneously, as in Wien's experiments, except that a vibration galvanometer was used in place of the optical telephone originally employed by Wien. The author's deduction from his experiments was that the resistance of an electrolyte varies with the frequency of the alternating E.M.F. applied.—Prof. G. W. O. Howe: Oscillatory currents in coupled circuits. A demonstration was given by means of a double projection oscillograph of the currents in coupled oscillatory circuits. Each circuit consisted of a condenser, an air-core choking coil, and a strip of the oscillograph. The condenser in the primary circuit was charged and discharged by means of a commutator on the spindle of the oscillograph motor. The two circuits may be taken to represent the condenser circuit and the aerial of a wireless telegraph sending apparatus, the frequency being two or three hundred instead of a million. The currents in the two circuits can be studied, and every change due to a variation in the damping of either circuit or in the coupling between the two circuits can be followed. This was illustrated by a series of typical photographic records. A third oscillatory circuit may be taken to represent a wave-meter, and used to plot resonance curves, from which the damping can be calculated, as is commonly done in radio-telegraphic work. Here, however, we have the great advantage of knowing the damping accurately, and thus being able to check the resonance curve results under various conditions. By altering the connections, the conditions of the quenched spark sending apparatus, as used by Max Wien, Lepel, &c., was represented. Here the primary circuit is opened at the first moment that all the energy has been transferred to the secondary circuit, and no further beats or spark-gap losses occur. Results were given showing that the oscillograph can be used to find the losses in condensers at various frequencies by discharging the condensers through inductances of known resistance.—Prof. G. W. O. Howe: Some radio-telegraphic apparatus in use at the City and Guilds College. The wireless telegraphic receiving apparatus was shown connected up to the aerial, which is 260 feet high. A transformer specially designed for experimental work at long wave-lengths was shown. By means of a Brown telephone relay and special trumpets fitted to the telephone receiver, the time signals and messages sent out from Norddeich and from the Eiffel Tower can be plainly heard anywhere in the lecture theatre. The various types of receiving apparatus in use at the college were shown.

**Zoological Society, April 4.**—Dr. Henry Woodward F.R.S., vice-president, in the chair.—Dr. H. B. Fantham and Dr. Annie Porter: Diseased bees and combs infected with a minute pathogenic protozoal parasite, apparently the same as *Nosema apis* found by Zander and Doflein in diseased bees in Bavaria. Microscopic preparations and drawings of the parasite, *N. apis*, were also shown, as

well as healthy bees and combs in contrast. The material was obtained from Cambridgeshire and Hertfordshire in March. The infected combs were brown in colour instead of the normal yellow, while the infected bees suffered from a sort of dry dysentery, which rapidly proved fatal. The pathogenic agent of this dry dysentery, *N. apis*, formed thousands of minute spores, which fouled the hive, while infection was probably spread to new hives by hungry, weakly bees attempting to enter healthy hives. The spores, about 2 to 3  $\mu$  by 4 to 6  $\mu$ , were the resistant and cross-infective stages of the protozoon. The parasite *N. apis* was closely allied to that of pébrine, the silk-worm disease due to *N. bombycis*. The trophozoite and pansporoblast stages of *N. apis* had been observed, as well as some spores with polar filaments extruded. Like *N. bombycis*, the bee-parasite was possibly capable of hereditary infection, as infected bee-larvæ had been found. The only certain destructive agent of the microsporidian spores was fire, and all infected bees and hives, and any débris therefrom, should be most carefully burned. In the opinion of the exhibitors, the microsporidian parasite *N. apis* had been responsible for much of the bee-disease recorded in this country since 1906, especially in 1906, 1907, and 1911. The exhibitors first noticed the parasite in 1906 in diseased bees obtained from the Isle of Wight; its full significance was grasped in 1907, but owing to the difficulty of obtaining material the exhibitors' results were not published. As much attention was now being directed to "bee-disease," the exhibitors briefly recorded their observations. It was not asserted that microsporidiosis was the only disease of bees current in Great Britain at present, as Dr. Maiden had investigated a bacillary infection in bees. Microsporidiosis had probably been introduced from the Continent into British apiaries.—Dr. R. T. Leiper: Nematode parasites obtained from animals in the Zoological Gardens during the year ending November, 1910. The collection contained a number of new forms, of which a systematic account will be published later. Among the more interesting of the known forms were *Rictularia plagiosoma* from a palm-civet, a number of species of *Polydelphis* from various pythons, *Dicheilomena horrida* from the South American ostrich, and *Dictyocaulus filaria* from the lungs of sheep. From the observations it appeared that the change of food and general conditions obtaining in the gardens were unfavourable to the continued existence of the intestinal parasites an animal may harbour on its admission. The number of cases of auto- and re-infection during captivity was strikingly small, and bore testimony to the cleanly surroundings in which the animals were kept. In four cases only was there evidence of the occurrence of accumulative infection in the gardens:—(1) a number of giant toads died from lung infection with *Rhabdias bufonis*; (2) the wolves appeared to be heavily infected with *Ascaris canis*; (3) a sheep died from pneumonic condition resulting from an intense infection with *Dictyocaulus filaria*; (4) the tortoises had oxyuriasis. In all these cases repeated infection undoubtedly had followed from contamination of food and drink with fæces containing eggs of the parasite. The infection could be eliminated by steam sterilisation of the cages, or still more easily by changing the species of animal living in the particular paddocks or cages, for helminthes were often peculiarly selective as regards their hosts, and those flourishing in one animal sometimes found it impossible to continue their life even in closely allied forms.—F. E. Beddard: Some mammalian tapeworms collected from animals which had died in the society's gardens. This collection was the result of nearly two years' examination of a very large number of animals, but did not contain a very large number of species. Tapeworms were by no means so common as other parasitic worms, particularly nematodes, which were the most abundant among the animals in the gardens.—J. A. Mörch: The natural history of whalebone whales. The paper directed attention to, and threw light upon, some of the problems connected with the migrations of the larger Cetacea.

**Linnean Society**, April 6.—Dr. D. H. Scott, F.R.S., president, in the chair.—Miss Sarah M. Baker: The brown seaweeds of the salt-marsh.—Conjoint communication on the genus *Salicornia*. (1) Dr. C. E. Moss: A

history of the genus from Linnæus, "Species Plantarum," ed. 1, 1753, to the present time; (2) E. G. Salisbury: An exposition of the characters of the species comprised in the genus; (3) Dr. Ethel de Fraigne: The anatomy of certain species in the genus.

PARIS.

**Academy of Sciences**, April 3.—M. Armand Gautier in the chair.—F. Henneguy: Experimental parthenogenesis in the Amphibia. The eggs of the frog (*Rana fusca*) were caused to develop parthenogenetically by simple puncture, following the method suggested by M. Bataillon. Comparison batches of eggs were impregnated in the ordinary way. Out of a large number of the punctured eggs, four only became normal tadpoles, and these were smaller than the tadpoles from the comparison batch.—Albert I., Prince of Monaco: The twelfth campaign of *Princesse Alice II.*—Sir J. J. Thomson was elected a correspondent for the section of physics in the place of H. Lorentz, elected foreign associate.—Th. De Donder: Jacobi's multiplier.—M. Devaux-Charbonnel: The direct measurement of diminution of loudness, and of the characteristic of telephone lines.—Victor Henri and Samuel Lifchitz: The kinematographical study of the displacements of ultra-microscopic particles produced by very rapid sound shocks. The action was shown to be a mechanical one, and to be independent of the electrical charge on the particles.—Paul Lebeau: The formula of uranium carbide. Analyses of some ingots of uranium containing carbon showed a percentage of the latter higher than would correspond with the  $U_2C_3$  of Moissan. Castings were then prepared containing various proportions of uranium and carbon. Metallographic examination proved all of these to consist of a single carbide with varying amounts of graphite. It was found necessary to considerably modify the analytical method used by Moissan in the analyses of these compounds, and the true formula of the carbide was found to be  $U_2C_2$ .—M. Driot: Mercury oxychlorides. Four oxychlorides,  $HgCl_2 \cdot 3HgO$ ,  $HgCl_2 \cdot 2HgO$ ,  $HgCl_2 \cdot HgO$ , and  $2HgCl_2 \cdot HgO$ , have been isolated, and each of these exists in one form only.—E. E. Blaise and L. Picard: The mode of formation of ethyl chloroethoxyacetate; the use of this ester in the synthesis of the  $\alpha$ -acid alcohols. An attempt to prepare the chloride  $(C_2H_5O)_2CH.CO.Cl$  failed, a molecular transposition taking place, and the compound  $C_2H_5O.CHCl.CO_2C_2H_5$  being produced.—P. Lemoult: The new series of leucobases and colouring matters derived from diphenylethylene.—G. André: The conservation of the salt material in an annual plant: distribution of the fixed elements.—P. A. Dangeard: The conditions of chlorophyll assimilation in the Cyanophyceæ.—Jean Bonnet: Nuclear fusions without sexual character.—M. Vermorel and E. Dantony: The increase in the moistening power of anticyptogamic solutions for spraying.—E. Kayser: Researches on the juice of beer yeast.—L. Bordas: The intestinal cæcum and the rectal glands of the Lepidoptera.—P. Chaussé: Experimental tuberculosis in the dog. Under normal conditions, the latent mesenteric tuberculosis experimentally produced in the dog completely disappears from the system in 200 days.—L. Cayeux: The marine deposits resting on the middle Miocene in Crete.—Alphonse Berget: The exact determination of the salinity of sea water by the measurement of the index of refraction. The refractometer was modified to read the index to 0.0001, and the relation between refractive index and concentration of salt was shown experimentally to be linear.

CAPE TOWN.

**Royal Society of South Africa**, March 15.—Dr. H. H. W. Pearson, vice-president, in the chair.—Dr. Thos. Muir: Sylvester's and other unisignants. Unisignant is the name given to a peculiar class of multifunctional functions which though expressible as determinants are quite unlike the latter functions in their properties, having, for example, in their final development nothing but positive terms. Probably the first instance of such a function was observed by Sylvester. The object of the present paper is to throw fresh light on Sylvester's work by bringing it into the same field of view with certain recent investigations of a more

general character about to appear in *The Quarterly Journal of Mathematics*.—R. T. A. **Innes**: Upon the fourth order perturbations in the motions of Satellites III. and IV. of Jupiter. The author recomputes and practically confirms the values of certain long-period inequalities in the longitude of the third great satellite of Jupiter originally discovered by the late M. de Haerdtl. These inequalities are due to the near approach of commensurability of the mean motions of the III. and IV. satellites; seven times the mean motion of IV. being nearly equal to three times that of III, so that although these inequalities depend on the 4th powers of the eccentricities they exceed the limit of II. adopted in Prof. Sampson's "New Tables of the Great Satellites of Jupiter, 1910." The inequalities in the motion of IV. are now computed for the first time. In the sum these inequalities will at times amount to about  $8''$  in the longitude of III. and  $10''$  in that of IV.—C. L. **Biden**: The funeral ceremonies of the Hottentots. The Hottentots have their medical men who treat patients during illness. Like most South African tribes, witchcraft is practised by these medicine men, and the sick are told that their enemies, bad relatives, and bad neighbours are the cause of illness. In the event of death following, the medicine man attributes the disaster to the bad influence of certain parties, actually naming the persons he thinks concerned. Formerly these responsible persons were put to death; now it leads to much hatred and personal feeling among the Hottentots. Immediately after death they prepare for the funeral. A grave is dug by means of a gemsbok horn and a roughly made wooden shovel. The ceremonial is then described. After the funeral a dance is held, and festivities are indulged in all through the night. For a few weeks the male relatives of the deceased go to the grave every morning before sunrise, quite naked, and pray to the "taas" (ghost). After that time they suppose that the ghost has left the grave and has entered an animal called by them "thas" jackal. This animal they assert has never been caught, and it can only be killed by a silver bullet.—Prof. W. A. D. **Rudge**: The meteorites in the Bloemfontein Museum. The paper contains an account of the meteorites in the Bloemfontein Museum. There are two fragments of the Kroonstadt fall of 1877. These apparently consist of a tough fibrous mass of iron-nickel alloy, with an aggregation round it of fine particles of silica (asmanite?) troilite pyrites, and apparently feldspar. The larger meteorite which fell at Winburg, 1881, contains 94 per cent. of iron and 2 per cent. of nickel. The nickel is confined to a few veins which run through the mass of the meteorite. From these veins crystals of the alloy can be separated by dilute sulphuric acid in which the alloy is insoluble. These crystals seem to be skeleton forms built up of triangular plates, the interstices being filled up with amorphous carbon. The iron is very soft, but patches of hardness occur. The "Widmanstätten" lines are not so well developed as in most iron meteorites, probably due to the nickel being located in veins instead of disseminated throughout the whole mass. The weight of this meteorite was about 50 kilogrammes, and it is markedly magnetic, having a number of poles. The alloy of nickel and iron retains its susceptibility up to a dull red heat.—J. R. **Sutton**: Seismographic record of the South African earthquake of October, 1910. The extent of the movement of the horizontal pendulum during the quake was about one-half its average daily E.W. oscillation.—James **Moir**: (1) Colloidal gold and purple of Cassius. Description of behaviour of chloroauric acid dissolved in 200,000 parts of water towards a number of reducing agents. The coloration produced by pure stannous chloride  $\text{SnCl}_2$  is not purple of Cassius, but a brown of remarkable stability, which the author shows is not due to extreme fineness of division, and which may be colloidal aurous chloride. Purple of Cassius results when  $\text{SnCl}_2$  and an oxidant with loosely bound oxygen are employed. The tin in the purple is shown to be merely a vehicle for finely divided gold, the shade varying from pink to indigo according to the rapidity of formation, the first division being obtained by the slow reducing action of glycerol. (2) Some remarkable oxidation products of benzidine. An investigation of the beautiful blue products obtained from benzidine by certain processes of oxidation, such as the blood test. The products obtained by the action of chromic acid and of ferricyanide are shown

to be the chromate and ferricyanide respectively of diphenoquinone-diamine  $\text{NH}:\text{C}_6\text{H}_4:\text{C}_6\text{H}_4:\text{NH}$ , but the latter is an extremely reactive substance and polymerises easily to very insoluble substances of the aminoazo-dye class. Benzidine is the sole reduction-product of the blue substances as freshly prepared. The violet azo-dye appears to be  $\text{NH}_2\text{C}_6\text{H}_4\text{N}:\text{N}:\text{C}_6\text{H}_4\text{NH}_2$ .—H. W. **Tarbutt**: The Egyptian influence on Rhodesia ruin builders, or *vice versa*. The object of this note is to show that MacIver's statement that the Rhodesian ruins are of native origin does not seem too improbable, if the articles found in or about the Rhodesian ruins are compared with similar articles of Egyptian primitive art. The author contends that the very resemblance between them is not confined to one or two articles, but to almost everything that has been found, and illustrations comparing the Rhodesian and Egyptian objects are given to support the theory.

## DIARY OF SOCIETIES.

WEDNESDAY, APRIL 19.

ROYAL METEOROLOGICAL SOCIETY, at 7.30.—Variations in the English Climate during the 30 years, 1881-1910: W. Marriott.—(1) The Value of the Two-theodolite Method for determining Vertical Air-motion; (2) An Automatic Valve for Pilot Balloons: Captain C. H. Ley.

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