at Galesburg, Ill., has collected a fund of 100,000 dollars, thus securing the additional gift of 25,000 dollars made by Dr. D. K. Pearsons.—Efforts are being made to persuade President Taylor not to leave Vassar College for Brown University. With this end in view, a meeting of the Alumni decided to try to collect the sum of 2,000,000 dollars for the endowment of Vassar.

AN address by Prof. S. W. Holman on "The Function of the Laboratory," published in *The Technology Review*—a quarterly magazine relating to the Massachusetts Institute of Technology—is of interest in connection with the discussion which has lately taken place in these columns as to the relation between polytechnic institutions and industrial chemistry. Prof. Holman points out that the man whose occupation is exclusively the practice of an art (other than the fine arts) is an artisan, not a member of the technical professions. The work of the technical professions is the direction and extension of the application of the arts, together with a far higher function—the development of the arts, that is, of technology. Prof. Holman's view is that the chief function of the engineer is to bring pure and applied science to the industrial service of mankind. It is for him to analyse the ever new industrial problems, bringing to bear upon them the scientific method of inquiry, and applying to their solution all related scientific as well as technical knowledge. And what is true of the engineer is equally true of the members of the other technical professions. Moreover, modern technical practice is progressing with such acceleration, and every branch of scientific knowledge is so diffusing itself into every line of engineering, that the coming generation of engineers will find the most thorough command of science which they can obtain a none too efficient aid in the keen competition of their future practice. Breadth of view, opportunity, ingenuity, and "common sense" being equal, he who is a master of science will distance competitors. Science, then, and its methods must rank first; applied science, second; artisan skill, last.

SCIENTIFIC SERIALS.

Bulletin of the American Mathematical Society, February.—Prof. F. N. Cole gives an account of the fifth annual meeting of the Society, and abstracts several of the papers which were read. It appears that this young Society is in a very flourishing condition. Prof. Cole stated that two factors have contributed powerfully to increase the Society since its reorganisation as a national body (originally it was the New York Mathematical Society). One of these is the institution of summer meetings, held usually in connection with the large general scientific gatherings; and the other is the founding of the Chicago Section, which works in perfect harmony with the general Society.—Prof. Holgate follows with an account of the December meeting of this Chicago branch.—Some thirteen papers were read, and a few of these are given in abstract.—A valuable "report on recent progress in the theory of the groups of a finite order" is a paper by Dr. G. A. Miller, a well-known authority in this field of work. It was read at the meeting of the American Association, held at Boston in August last. The period considered extends over the last ten years, and a full list of works is given. These are considered under the heads of (1) Soluble groups, (2) Simple groups, (3) Substitution groups, (4) Abstract groups, and winds up with a general conclusion. The author's aim has been to call attention to only a few of the important recent advances in the theory.—The same gentleman adds a short note on Burnside's "Theory of Groups."—Prof. F. Morley contributes a short article on a regular configuration of ten line pairs conjugate as to a quadric. This note, which was read before the Society in October, is an addendum to the same author's account of the model laid before the London Mathematical Society in June last (*Proc. L.M.S.*, vol. xxix).—A few short reviews follow: Einleitung in die Theorie der Bessels'chen Funktionen, by Prof. Graf and Dr. Gubler; Leçons de Cosmographie, by MM. F. Tisserand and H. Andoyer; Lectures on Elementary Mathematics, by J. L. Lagrange (McCormack's translation); &c. An account is given of the new publication, *L'enseignement Mathématique*, edited by MM. Laisant and Fehr. Its object is to contribute to the improvement of mathematical instruction by making more widely known its organisation in different countries, by discussing methods of teaching, &c.—Prof. Greenhill contributes a long and excellent review of Prof. Appell's éléments d'analyse mathématique.—Dr. Lovett has a full budget of *Notes*, and there is a good list of new publications.

IN the *Journal of Botany* for March is an interesting paper, by Mr. B. Daydon Jackson: on a review of Latin terms used in botany to denote colour. Mr. Jackson enumerates all the terms used by Latin writers, with their different shades of meaning, classifying them under twelve heads, viz. (1) terms implying absence of colour; (2) white; (3) grey (cold neutrals); (4) black; (5) brown (warm neutrals); (6) red; (7) orange; (8) yellow; (9) green; (10) blue; (11) purple; (12) terms implying colour without defining it, and vague terms. A useful bibliography is appended.

Bollettino della Società Sismologica Italiana, vol. iv., 1898, No. 7.—The earthquake of Hayti (West Indies), in the morning of December 29, 1897, by G. Agamennone.—On the form of the slow oscillations in earthquakes. by G. Grablovitz. Argues that the records furnished by pendulums are to be attributed to the composition of the effects produced in them by horizontal motions and tilts of the ground, and not exclusively by either.—List of earthquakes observed in Greece during the year 1895 (July to December), by S. A. Papavasiliou, the total number being about 260 (of which 105 were observed in the island of Zante), *i.e.* about one and a half per day.

SOCIETIES AND ACADEMIES.

LONDON.

Linnean Society, March 2.—Dr. A. Günther, F.R.S., President in the chair.—Mr. H. M. Bernard showed some microscopic sections of the digestive cæca of spiders, which had led him to the conclusion that digestive, assimilatory, and excretory functions are all performed by these.—Mr. J. E. Harting exhibited a male specimen of the rare King Eider (*Somateria spectabilis*) which had recently been forwarded in the flesh from Lerwick, and called attention to the colours of the soft parts, which differed materially from the colours represented by Gould in his folio plate of this species. After referring to the natural haunts of this duck in the Palæarctic and Nearctic regions, he described it as a bird of such rarity in the British Islands that since it was first noticed as a visitor to the coast of Norfolk in 1813, not more than a score of examples had been met with, the last of which was reported in November 1890.—The President referred to the statement of Colonel Montagu, made on the authority of Bullock, that the King Eider had nested in Papa Westra, an observation which had not been confirmed; and Mr. H. Druce made some remarks on the process of bleaching to which the eider-down of commerce is generally, though not always, subjected.—Mr. G. C. Druce exhibited and made remarks on specimens of *Dianthus gallica* from Jersey.—Mr. W. P. Pycraft read a paper on the external nares of the cormorant, intended to supplement a communication on the same subject made some years ago by Prof. J. C. Ewart (*Linn. Soc. Journ., Zool.*, xv., 1881, p. 455). Mr. Pycraft found in every species of cormorant which he had examined that the external nostril lies without and below the rhinothecal groove, and not at its end as had been previously described. He had failed in every case to pass even the finest bristle up this groove into the nasal cavity. In the gannets (*Sulæ*) he had not been able to find any trace of this nasal groove or aperture. Further remarks were made by the President, Prof. Howes, and Mr. Harting, chiefly in regard to the bearings of the facts on correlation of structure with habit.—Mr. G. C. Druce read a paper on the reported occurrence in Ireland of *Carex rhynchophysa*, and gave reasons for believing that *Carex rostrata* var. *latifolia* had been mistaken for it. Typical specimens of both were exhibited, and also a coloured drawing by Mr. N. E. Brown of one of the plants collected by Mr. Lloyd Praeger, near Mullaghmore Lough, Armagh. Some further remarks were made by Mr. C. B. Clarke, more especially with reference to the descriptions of plants believed to be new to British flora.—Mr. Edward Step, read a paper on the fertilisation of *Glaux maritima*. After examining some hundreds of flowers gathered along the coast near Portscatho, Cornwall, he had come to the conclusion that the flower is protogynous. When open, the calyx-lobes at first separate but slightly, affording only a narrow entrance. The curvature of the style is sufficient to bring it within the fold of a calyx-lobe, from which the stigma projects so as to be in the way of any insect that visits the flower for the liquid that exudes

from the ovary and base of the style. When the yellow pollen is shed, the style is either quite erect, or retains its original bend sufficiently above the anthers to make self-fertilisation probable. Owing to the lowly habit of the plant and its customary crowding in with sea-sedge and grasses, it is not an easy one to watch. Doubtless it is often fertilised with its own pollen by the agency of flies and other insects; but from the position and precocity of the stigma, Mr. Step considered that cross-fertilisation is quite as frequent. He was consequently unable to agree with Mr. Henslow (*Trans. Linn. Soc.*, n. s. *Bot.* i. 1880. p. 377, pl. 44., fig. 35) as to self-fertilisation in this plant, believing his conclusion to have been drawn from the examination of an abnormal specimen.

Zoological Society, March 7.—Prof. G. B. Howes, F.R.S., Vice-President, in the chair.—Mr. J. E. S. Moore exhibited and made remarks upon specimens of the Medusa (*Limnocnida tanganjicae*) of Lake Tanganyika, which he had obtained during his recent expedition to that lake.—Mr. R. E. Holding exhibited and made remarks upon a large pair of horns belonging to a species of Muntjac (*Cervulus*) received from Singapore.—Mr. W. E. de Winton exhibited and made remarks upon the tail of a Common Fox (*Canis vulpes*), showing the gland on the upper surface covered with straight coarse hair, the existence of which appeared to be little known.—Dr. Arthur Keith read a paper on the relationship of the chimpanzees to the gorilla. He referred to the ape "Johanna," which is on exhibition, under the name of a gorilla, at Messrs. Barnum and Bailey's menagerie, but which was undoubtedly a chimpanzee. "Johanna" showed all the characters of "Mafuka," an ape which, when exhibited in the Zoological Gardens at Dresden, gave rise to a prolonged discussion as to her nature. Both evidently belonged to the variety or species of chimpanzee to which Du Chaillu had given the name of "Kooloo-kamba." "Johanna" was the first chimpanzee, so far as Dr. Keith was aware, that had lived long enough in captivity to complete her dentition, which apparently finished, by the appearance of the canine teeth and last molars, about the twelfth or thirteenth year. She was the second chimpanzee in which the phenomena of menstruation had been observed. In her it occurred every twenty-third or twenty-fourth day, and lasted for three days; the discharge was profuse, and first appeared in about the ninth or tenth year. All the chimpanzees, with the characters of "Johanna," appeared to come from the West Coast of Africa, south of the equator. "Johanna" had the habits and mental temperament of the chimpanzee; her teeth, hands, nose, and ears were also characteristic of that species. Evidence was produced to show that the gorilla, in many of its characters, was the most primitive of the three great Anthropoid apes, and probably retained more of the features of the common anthropoid parent than either the chimpanzee or orang-utan. The chimpanzee was to be looked on as a Gorilline derivative in which the teeth had undergone very marked retrograde changes, accompanied by corresponding changes in the skull and muscles. The various races or species of chimpanzee described differed in the degree to which they had lost their Gorilline characters. Most of the characters which had been ascribed to these species were really only characters of individuals, or were due to age or sex. The skulls of the Central-African chimpanzee certainly showed distinctive features. It was probably a well-marked race. There was not enough material collected as yet to allow a definite statement to be made as to the distinctive features of other races. Du Chaillu was the best guide up to the present time, and the Central-African form might be added to the three species described by him. It was possible, however, that it might be found of the chimpanzees, what Selenka has shown to be true of the orang-utans, that these species were of the nature of local forms.—Mr. W. L. H. Duckworth read a note on the specific differences in the Anthropoid apes, dealing in the first place with a specimen in the Zoological Museum at Jena. The specimen in question was labelled "young female gorilla," but Mr. Duckworth had come to the conclusion that it was not a young animal, and that it was a chimpanzee and not a gorilla. In the second place, the work of Profs. Kukenthal and Ziehen on the "Cerebral Hemispheres of the Primates" was dealt with, and the failure of these authors to recognise the identity of *Gorilla engena* and *Troglodytes savagii* was commented on. Lastly, the reported occurrence of a gorilla at Stanley Falls on the Congo was mentioned, though the specimen in question seemed to be rather a chimpanzee than a gorilla.—Prof. B. C. A. Windle and Mr. F. G. Parsons presented a paper on the muscles of the head, and forelimb of the Edentata. The results were obtained by comparing the already existing scattered literature with a series of recent dissections. In some cases five or six records of the same animal were present, and thus the risk of stating individual variations as the normal arrangement was lessened. This paper was a purely technical record, all generalisations and deductions being reserved for a second part.—Mr. Martin Jacoby contributed a second part of a paper entitled "Additions to the knowledge of the Phytophagous Coleoptera of Africa." It contained descriptions of seventy-two new species of the groups *Halticinae* and *Galerucinae*, six of which had been made the types of new genera.

Mathematical Society, March 9.—Lieut.-Colonel Cunningham, R.E., Vice-President, in the chair.—Dr. Larmor, F.R.S., made some remarks on the phenomenon of Zeeman and its bearing on the problem of the origin of spectra. Dr. Hobson, F.R.S., and Mr. Hargreaves spoke on the subject of the communication.—Dr. Macaulay read a short note by Mr. G. B. Mathews, F.R.S., on involution.—Other papers communicated were: Note on the expansion of tan (sin θ) − sin (tan θ) in powers of θ, Mr. R. H. Pinkerton; note on a property of groups of prime degree, by Prof. Burnside, F.R.S.; and note on the invariant total differential equation in three variables, by Prof. J. M. Page. In the last paper it was pointed out that any number of *types* of invariant total equations can be established; and, in a large number of cases, they can be established very simply. When these equations satisfy the condition of integrability, they can be integrated by a quadrature; and when they do *not* satisfy that condition, the *general* solution of any one of them can be found by a quadrature. Moreover, if the condition of integrability is satisfied by a total differential equation, so that its integral has the form $\phi(x, y, z, c) = 0$, the envelope of these surfaces (that is, the singular solution of the total equation), if one exists, can be found by algebraic operations; and the cuspidal edge of the envelope (if one exists) can be found by algebraic operations, and one differention.

Royal Meteorological Society, March 15.—Mr. F. C. Bayard, President, in the chair.—Mr. F. J. Brodie read a paper on the prolonged deficiency of rain in 1897 and 1898. For several years past there has existed over England, and especially over the central and south-eastern parts of the country, a remarkable tendency in favour of dry weather. The dry weather dealt with in this paper consequently came at a most inopportune time, and its effects, which would in any case have been sufficiently evident, were greatly aggravated by the state of things existing so long previously. Mr. Brodie discussed the rainfall records at eighty stations distributed over the British Isles for the eighteen months, April 1897 to September 1898; these were divided into three periods of six months each. During the period April to September 1897, the rainfall was in excess of the average over practically the whole of Ireland, the greater part of Scotland, and the north-west and south-west of England and Wales; while in the north of Scotland, and the central and the whole of the eastern part of England there was a deficiency of rain, in some parts amounting to between 60 and 70 per cent. During the period October 1897 to March 1898, with the exception of the north-west of Scotland and England, the rainfall was below the average all over the British Isles, the deficiency over the midland and south-eastern parts of England being from 50 to 60 per cent. below the average. During the period April to September 1898, two of the six months were excessively dry, and in the southern parts of England at least two others had a deficiency of rainfall. Taking the period as a whole, the rainfall over the eastern, midland and southern counties amounted to less than 80 per cent. of the average, and in the south-eastern counties to less than 60 per cent., the smallest proportion of all being 51 per cent., in London. From an examination of the Greenwich rainfall records since 1841, it appears evident that for length and severity combined, the recent spell of dry weather was the most remarkable experienced there during that period.—A paper on the climate of Jersey, by the Rev. H. W. Yorke, was read by the Secretary. The situation and geological formation of the island, together with the action of the tides, have a great local effect upon the general character of the weather. The climate as a whole is bright, genial and sunny.

MANCHESTER.

Literary and Philosophical Society, February 21.—Mr. J. Cosmo Melvill, President, in the chair.—Dr. C. H. Lees gave an account of some preliminary experiments on the effect of pressure on the thermal conductivities of rocks and other substances, which he had undertaken with the view of providing data for a recalculation of the age of the earth by Lord Kelvin's method. The experiments showed that there was a slight tendency for the thermal conductivity to increase with pressure, which would render necessary a small lowering of the earth's age given by Lord Kelvin.—On the plague in Uganda, by the Right Rev. Bishop Hanlon (Uganda). The author described the plague, which is known by the natives as "kaumpuli," as being akin to the black plague which once scourged London. It begins suddenly, there is high fever, and a swelling, usually under the armpit. Like many plagues, it has both a mild and virulent form. The first is not attended with much fever; the swelling moves about the body, and, should it get near the heart or into the throat, death may ensue. In the virulent form the swelling seems stationary, either under the armpit or in the fork of the legs, whilst the patient dies if not speedily attended to, this being the case with many sufferers before their condition has become known to a European. This form is considered very infectious; the natives shun the sick person, and will on no account bury those who die; they even remove from the neighbourhood of the hut where the patient died. The natives have a remedy for the disease, but never have it ready to hand when required; the missionaries, therefore, keep it prepared. This remedy consists of a certain insect—a common native fly—many of which are crushed and mixed with vinegar, the preparation thus made being rubbed on the swelling. So great is the terror of the natives when attacked by the disease, that the missionaries' greatest fear is lest death should happen from sheer fright. Buddu has for many years been the centre of this plague in its worst form, and Bishop Hanlon disputes the statement made by Dr. Koch that the disease has travelled from other parts of Uganda to Buddu, and thence south to German territory, he being of opinion that the plague was introduced into Uganda by way of the German East African territory, which has been for many generations the chief Arab route to that part of Africa.

March 7.—Mr. J. Cosmo Melvill, President, in the chair.—A new version of Argand's proof that every algebraic equation has a root, by Prof. H. Lamb, F.R.S.—Prof. Schuster, F.R.S., exhibited some lantern slides illustrating researches made by Mr. G. Hemsalech and himself on the velocity of metallic molecules in the electric spark (see p. 350).

DUBLIN.

Royal Dublin Society, February 22.—Prof. G. F. Fitz-Gerald, F.R.S., in the chair.—Prof. T. Johnson gave an account of the improvement of bog land, illustrating his remarks by an account of the work carried on by Dr. Baumann at the bog experimental station, Bernau, Bavaria, visited by him last year.—Prof. W. F. Barrett read a paper on the remarkable thermo-electric behaviour of certain alloys of nickel steel. In the course of an examination of the physical properties of numerous alloys of steel prepared by Mr. R. A. Hadfield, of the Hecla Steel Works, Sheffield, the author found the thermo-electric behaviour of some of these alloys so remarkable as to be worthy of a separate note. Two alloys of nickel and manganese steel marked 1414 A and 1414 B, which had the enormous electric resistances of 90·6 and 97·5 microhms per cubic cm. respectively (see next paper), were found to give an almost constant electro-motive force through a wide range of temperature, when coupled with iron as the second metal. In the case of 1414 B coupled with the purest commercial iron, the electro-motive force rose rapidly up to a temperature of 300° C., and then remained practically constant up to 800° C., a range of 500° C., that is, from a low black heat up to a bright red heat. Such a couple would form a new standard of electro-motive force, as it is easily made and simply requires heating in any gas flame. Coupled with platinum instead of iron these alloys give an increasing electro-motive force, from about 200° C. to a white heat, the direction of the electro-motive force changing below 200° C. The second part of the paper deals with the curve of electro-motive force on cooling; which is found to be not coincident with that on heating in the case of iron and steel coupled with platinum. At corresponding temperatures a *lower* electro-motive force is noticed in cooling than in heating, the difference being least marked with pure iron, and most with steel, the temperature ranging from 0° to 900° C. The heating and cooling thermo-electric curves thus enclose an area which represents the molecular work done on the iron and steel during the cycle. This may be connected with the phenomena of recalescence. In the case of a couple of 1414 B and platinum the cooling curve, however, shows a higher electro-motive force than the heating curve at corresponding temperatures. The author is continuing his investigations on these and other points.—A paper on the electric conductivity and magnetic permeability of an extensive series of steel alloys (Part i.), by Prof. W. F. Barrett and Mr. W. Brown, was read by Prof. Barrett. This paper gives the main results of four years' work on upwards of a hundred different alloys of steel prepared by Mr. R. A. Hadfield. For the purpose of investigation the alloys were prepared in the form of rods 106 cms. long and about 0·5 cm. diameter. The electric conductivity was determined by the potential method, and referred to Matthiessen's standard of pure copper as 100. Some of the alloys could not be obtained in a homogeneous condition; those which could be were divided into three classes: (1) those with one element added in varying proportions, of which there were eight groups containing about fifty different alloys; (2) those with two elements added, of which there were fourteen groups, also with fifty different alloys; and (3) those with three or more elements added, of which there were five groups with six different alloys. The results were plotted in curves, and show the strikingly different effect which the addition of different elements have on the conductivity of iron. The alloys of tungsten steel diminishing the conductivity *least* and those of aluminium and silicon *most*, manganese having almost as great an effect as the two latter. In all cases the conductivity rapidly falls with small additions of a foreign element up to 2 per cent. in some cases, and 7 to 10 per cent. in others, after which larger additions of the foreign element have but a small effect on the conductivity. In the case of eight different alloys the material was obtained in the form of wire and strip, and the specific resistance and temperature coefficient determined in this condition. The highest resistance was obtained with a nickel-manganese steel alloy marked 1414 B, which gave the enormous resistance of 97·52 microhms per cubic cent. and the remarkably low temperature coefficient of 0·085 per cent. per 1° C. Another similar alloy, marked 1414 A, with somewhat less nickel, had a specific resistance of 90·62 microhms per cubic cent. and a temperature coefficient of 0·1046 per cent. per 1° C.; another gave 89 microhms. These exceed rheostene, also an alloy of nickel and manganese steel, which was found by the authors in 1895 to have a specific resistance of 83·1 microhms per cubic cent. and a temperature coefficient of 0·109 per cent. per 1° C. The second part of the paper deals with the magnetic properties of these alloys. Permeability tests were made, and complete H and B curves obtained for forty-four different alloys. The results are given in the curves and tables attached to the paper. A standard curve was obtained of the purest commercial iron containing less than 0·03 per cent. of carbon. In the case of the tungsten steels, the results are extremely remarkable and of practical importance in the discovery of the best alloy for the construction of permanent magnets. The effect of nickel in the magnetic permeability is also very striking: here, as in other cases, the thermal treatment of the alloy after manufacture was a matter of much consequence. The rods were therefore all submitted to the same thermal treatment, and the permeability taken after annealing. In addition, duplicate sets of many of the alloys were made in the annealed, and unannealed condition, and the electric conductivity and magnetic permeability with complete B and H curves determined in both conditions. The annealing process consisted in heating the rods to a temperature of 1000° C. in a large annealing furnace, and then allowing them to cool very slowly down to the temperature of the air. This took nearly 100 hours, or upwards of four days and four nights.

EDINBURGH.

Royal Society, February 20.—Prof. Chrystal in the chair.—Dr. Buchan, in a communication on the tidal currents of the North Sea, drew attention to the facts which had been established by experiments made by the Scottish Fishery Board. According to Dr. Fulton's summary, the current of surface waters was down the east coast of Scotland and England as far as Spurnhead, then eastwards towards the north of Denmark, and finally

northwards along the Norwegian coast. Dr. Buchan pointed out that two important factors contributed to the production of this system of currents. (1) The earth's rotation causing a westward lag of water passing from higher to lower latitudes, and an eastward acceleration of water flowing from lower to higher latitudes; and (2) the westerly and south-westerly direction of the prevailing winds giving the eastward set to the water between the Wash and Denmark. Considerable discussion followed this paper, Sir John Murray expressing doubt as to the sufficiency of the evidence for the particular circulation of currents given on Dr. Fulton's map, while Dr. Knott doubted whether the observed drift of bottles in the North Sea should be ascribed to the *tidal* currents as such, and not rather to the resultant effect of wind over the Atlantic superposed upon the tidal ebb and flow.—Prof. Tait's paper on the experimental bases of Prof. Andrews' paper on the continuity of the gaseous and liquid states of matter (*Phil. Trans.*, 1869), was a communication of data hitherto unpublished, the necessity for which for certain purposes had been pointed out by Mr. Tsuruda, of Tokyo University, in a recent letter to NATURE.—Dr. C. G. Knott, in a note on magnetic twist in nickel tubes, showed how remarkably accordant were the results of experiment with the theory that the twist in a nickel tube, circularly and longitudinally magnetised, was to be explained in terms of the elongations along and perpendicular to the magnetising force. It was necessary, however, to take into account the effects of hysteresis.

Mathematical Society, March 10.—Dr. Morgan, President, in the chair.—The following papers were read:—"Note on attraction," by Prof. Tait (communicated by Dr. C. G. Knott); "On wireless telegraphy and high potential currents," by Mr. J. R. Burgess.

PARIS.

Academy of Sciences, March 13.—M. van Tieghem in the chair.—On the numbers of Betti, by M. H. Poincaré.—On the double cyanides, by M. Berthelot. Thermochemical studies on the replacement of potassium by hydrogen in cyanides by weak acids, such as boric and carbonic acids, sulphuretted hydrogen and phenol.—Does iodine exist in the air, by M. Armand Gautier. The air was carefully filtered over glass wool, and the deposit treated with water, so that iodine was looked for in three places, in those solid substances deposited on the glass soluble in cold water, substances deposited but insoluble in water, and gaseous substances carried on by the filtered air. The minute precautions necessary to guard against the accidental introduction of iodine are carefully described, and results given for air of various localities: town, country, sea and mountain. No iodine could be detected in the filtered air in any case; neither could any soluble iodides be found in the deposit on the glass. Minute traces could, however, be detected in the solid deposit after this had been fused with potash, showing that the iodine was present in the form of complex iodo-compounds, perhaps suspended spores, lichens, or algæ. Sea air contained thirteen times as much iodine as Paris air, the latter containing only ·0013 mgr. per 1000 litres.—An attempt at a new form of the relation $f(p, v, t) = 0$; the case of a state of saturation, by M. E. H. Amagat.—On the interpretation of a limited number of observations, by M. E. Vallier. The author discusses the effect upon the mean of a small number of observations of the same quantity, of rejecting one whose deviation from the mean is large.—M. R. P. Colin was elected a Correspondant for the Section of Geography and Navigation, in the place of M. Manen.—Observation of the Swift comet (1899 *a*), made with the large equatorial of the Observatory of Bordeaux, by M. F. Courty.—On two ancient Bielid showers, by M. D. Eginitis.—On the mechanism of the disintegration of hydraulic cements, by M. H. Le Chatelier. The disintegration of hydraulic cement after some months or years cannot be ascribed to the hydration of free lime or magnesia, as the latter would be a matter of days at most, but would appear to result from two causes: the greater or less solubility of the active constituents of the cement, and the variation of solubility of the solids with the pressure they support.—On the conditions of maximum sensibility of galvanometers, by M. C. Féry.—On a very sensitive coherer, obtained by the simple contact of two pieces of carbon; and on the proof of extra currents induced in the human body by electric waves, by M. Thomas Tommasina. The author has succeeded in making a detector for electric waves, or coherer, out of two electric light carbons, which possesses the property of losing its conductivity with extreme ease with a very slight shock.—Death by alternating electric currents, by MM. J. L. Prevost and F. Battelli.—On methyl-ethane-pyrocatechol, by M. Ch. Moureu. This substance has been prepared from ortho-oxyphenoxyacetone by two methods: one by the action of phosphorus pentoxide in presence of quinoline; the other by treating with acetyl chloride in presence of orthoformic ether.—Double iodates of manganese peroxide, by M. A. Berg.—Researches on αα-dimethyl-glutaric acid, by M. E. E. Blaise. Attempts to synthesise αα-dimethyl-glutaric acid having failed owing to the production of a pyrrolidine compound, this last substance was also prepared from the natural acid by conversion into the amide and treatment of this with hypobromite. The synthetical pyrrolidine derivative proved to be identical with that obtained from the natural acid, thus proving the constitution of the latter.—On the hæmatin of blood, and its varieties in different species of animals, by MM. P. Cazeneuve and P. Breteau. Pure crystallised hæmatin prepared from the blood of the cow, horse, and sheep showed distinct differences in composition, particularly in the amounts of iron and nitrogen.—On a very sensitive reaction of acetone-dicarboxylic acid, by M. G. Denigès. With acid solution of mercuric sulphate this ketonic acid forms an insoluble compound, even in very dilute solution. The time that the turbidity takes to appear after heating with the reagent is a function of the amount of ketone-acid present, and upon this fact the author bases a method of estimating citric acid.—Oxidation of secondary and tertiary amines, by M. Œchsner de Coninck.—Method of water analysis applicable to water softening on the technical scale, by MM. Léo Vignon and Meunier.—On the use of lime for preparing wool for the Aye-bath, by MM. Ch. E. Guignet and Em. David. The authors have successfully applied on the technical scale an observation of Chevreul on the favourable effect of a lime-water bath upon wool previous to dyeing.—On the reducing power of the tissues: muscle, by M. Henri Hélier.—Synthesis of some vowels, by M. Marage.—On the pathogenic agent in hydrophobia, by M. E. Puscarin.—On an oxydase secreted by the coli-bacillus capable of producing a pigment, by M. Gabriel Roux. The most suitable culture for this purpose was found to be an extract of the head of the artichoke, incorporated with gelatine in the usual proportions. This when sown with the *bacillus Coli communis* gives a copious culture, and acquires a fine emerald-green coloration. Under similar conditions the Eberth bacillus gives rise to no special tint.—On the Algæ which grow upon *Maia squinado*, in the Bay of Biscay.—On the use of colouring matters in investigating the origins of springs, and of waters filtering into these, by M. A. Trillat.

NEW SOUTH WALES.

Royal Society, December 7, 1898.—The President, G. H. Knibbs, in the chair.—The following papers were read:—"The group divisions and initiation ceremonies of the Barkunjee tribes," by R. H. Mathews.—"Native silver accompanying matte and artificial galena," by Prof. Liversidge, F.R.S. The specimens exhibited were obtained from between two courses of brickwork in the arch over the vault of an old reverberatory furnace; the upper course had been raised bodily, but remained intact, and the space between became filled to a thickness of about four inches with a layer of clean matte; the metallic silver occurs on the surfaces in the cracks and crevices of the matte and bricks.—"The blue pigment of corals," by Prof. Liversidge, F.R.S. The coral examined was *Heliopora coerulea*, obtained by Prof. David from Funafuti Atoll when conducting the Coral Reef Exploration in 1897. He states that it is very abundant there in places. The specimens were of a dull, light slate-blue colour externally and a little darker internally (see Moseley's paper in the *Challenger* Report, Zoology ii., p. 109). The pigment has not yet been obtained in a pure condition, as the quantity at disposal was very small. Neither has it yet been obtained in a crystallised condition; its best solvent appears to be glacial acetic acid, to which it imparts a rich blue colour. It appears to be quite distinct from indigo, also from the blue pigment of lobster-shell and other blue substances; the colour of the emu egg-shell seems to be somewhat similar. Its ash contains a good deal of iron, phosphoric oxide, lime, and some magnesia. Rather more than 1 per cent. of the crude pigment was obtained from a freshly collected specimen; an old water-worn dead specimen yielded only ·26 per cent. of pigment. It does not readily lend itself to dyeing either silk, wool, or cotton. On extracting it

in a percolator with glacial acetic acid or with absolute alcohol, it after a time changes to a green colour. Dilute solutions of indigo in acetic acid or of sulphindigolic acid fade much more quickly than solutions of the coral blue of equal depths of colour.

AMSTERDAM.

Royal Academy of Sciences, January 28.—Prof. Van de Sande Bakhuyzen in the chair.—Prof. Martin read a paper on brackish-water deposits, occurring in the interior of Borneo, especially in the basin of the Kapooas. They came to the author's knowledge chiefly from the Mělawi (a tributary of the Kapooas). In that locality they contain species of *Arca*, *Cyrena*, *Corbula*, *Melania* and *Paludomus*, not one of which is known to have been found in other localities. Among these the occurrence of the genus Paludomus, two species of which have been found, both closely allied to still living Bornean species, is of particular importance. The deposits of the Mělawi must be of more recent date than the "intertrappian beds" of India, but still they belong in all probability to the Eocene period. Brackish-water deposits also occur along the Silat (another branch of the Kapooas), containing, however, a different fauna, chiefly characterised by the presence of two species of *Vivipara*. Perhaps these Silat sediments may prove to be older than the Mělawi sediments, but they certainly are not older than the Cretaceous formation.—Prof. Van Bemmelen on the isotherms (c, p) at 15° of dehydration, rehydration and redehydration of the hydrogel of Fe_2O_3 (c = percentage of water, p = vapour pressure), and presented on behalf of Mr. B de Bruyn a paper on the equilibrium of systems of three substances, two of which are liquids.—Prof. Cardinaal made a communication concerning Sir R. H. Ball's theory of screws, showing the application of Caporali's method of representation to screws, belonging to a system of the fourth order. Screws in a plane, or passing through a point, were chiefly discussed.—Prof. Lorentz on the vibrations of electrified systems, placed in a magnetic field. A contribution to the theory of the Zeeman-effect.—Prof. Jan de Vries on trinodal quartics. As is well known, the six points in which a trinodal quartic is cut by the lines that touch it in the nodes, lie in a conic, and there is a second conic, containing the points of tangency of the six tangents, that may be drawn from the nodes to the quartic. The author proved that these two conics have two residual points in common. In connection with the theorems, found by Brill (*Math. Ann.*, xii. 106, and xiii. 182), according to which the six points of inflexion are on a conic, which cuts the first-mentioned conic on the quartic, the residual points therefore belong to the three remarkable conics. The author also proved that the quartic contains three systems of inscribed quadrangles, so that in the case of each system the intersections of opposite sides coincide with the intersections of two bitangents.—Prof. Van der Waals presented a paper by Mr. J. J. Van Laar, of Utrecht, entitled, "Calculations of the second correction on the magnitude b of Van der Waals's phase equation."

DIARY OF SOCIETIES.

THURSDAY, MARCH 23.

SOCIETY OF ARTS, at 8.—London Water Supply: Walter Hunter.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—The Hissing of the Electric Arc: Mrs. Ayrton. (Illustrated by Experiments.)

FRIDAY, MARCH 24.

ROYAL INSTITUTION, at 9.—Transparency and Opacity: Lord Rayleigh, F.R.S.

PHYSICAL SOCIETY, at 5.—On the Criterion for the Oscillatory Discharge of a Condenser: Dr. Barton and Prof. Morton.—The Minor Variations of the Clark Cell: A. P. Trotter.

SATURDAY, MARCH 25.

ROYAL INSTITUTION, at 3.—The Mechanical Properties of Matter: Lord Rayleigh, F.R.S.

ESSEX FIELD CLUB (at Municipal Technical Institute, Stratford), at 6.30.—Annual Meeting.—Presidential Address: Life Problems in Modern Science: David Howard.—Life-History of the Tiger-Beetle (*Cicindela campestris*): Fred. Enock.

MONDAY, MARCH 27.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—Illustrations of Waves: Vaughan Cornish.

INSTITUTE OF ACTUARIES, at 5.30.—Some Notes on Sinking Fund Assurances: J. E. Faulks.

TUESDAY, MARCH 28.

ANTHROPOLOGICAL INSTITUTE, at 8.—Mitla (State of Oaxaca, Mexico): a Study of its Ancient Ruins and Remains: Wm. Corner. (With Lantern Illustrations, Maps, Plans, Drawings, and Antiquities).—Mr. Corner will also exhibit a Collection of Recent Photographs of North American Indians, taken by Rinehaut, Omaha, Neb., U.S.A.

ROYAL HORTICULTURAL SOCIETY.—Prof. Henslow's Demonstration.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Alloys of Iron and Nickel: Robert Abbott Hadfield.

ROYAL PHOTOGRAPHIC SOCIETY, at 8.—Ozotype with Carbon Tissues, a New Method of Pigment Printing: T. Manly.

WEDNESDAY, MARCH 29.

CHEMICAL SOCIETY, at 3.—Anniversary Meeting.—Election of Officers and Council.—President's Address.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

BOOKS.—Report of the Seventh Meeting of the Australasian Association held at Sydney, 1898 (Sydney).—Botanische Untersuchungen: S. Schwendener (Berlin, Borntraeger).—In the Guiana Forest: J. Rodway, new edition (Unwin).—Astronomical Observations and Researches made at Dunsink, Part 8 (Dublin, Hodges).—Energy and Heat: J. Roger (Spon).—The Entropy Diagram and its Applications: Prof. J. Boulvin, translated by B. Donkin (Spon).—The Administrative Control of Tuberculosis: Sir R. Thorne Thorne (Baillière).—Haunts and Hobbies of an Indian Official: M. Thornhill (Murray).—Funafuti: Mrs. E. David (Murray).—Queen's College, Galway, Calendar for 1898-99 (Dublin, Ponsonby).—Karl Ernst von Baer und Seine Weltanschauung: Prof. R. Stölzle (Regensburg, National Verlagstanstalt).—Report of the U.S. National Museum, 1896 (Washington).—The Dawn of Reason: Dr. J. Weir, jun. (Macmillan).—Allgemeine Erdkunde, iii. Abteilung (Wien, Tempsky).—The Lepidoptera of the British Islands: C. G. Barrett, Vol. v. (L. Reeve).—Examination of Water: Prof. W. P. Mason (Chapman).—The Microscopy of Drinking-Water: G. C. Whipple (Chapman).—Ichthyologia Ohiensis, or Natural History of the Fishes inhabiting the River Ohio and its Tributary Streams: C. S. Rafinesque and Dr. R. E. Call (Cleveland, Burrows).—Organoterapia: E. Rebuschini (Milan, Hoepli).—On Centenarians and the Duration of the Human Race: T. E. Young (Layton).—Sitzungsberichte der K. V. Gesellschaft der Wissenschaften. Math. Naturw. Classe, 1898 (Prag).

PAMPHLETS.—Address delivered by James Stuart, M.P., on the Occasion of his Installation as Lord Rector of the University of St. Andrews, January 23, 1899 (Macmillan).—The Chinch Bug (Washington).—The Water Supply of Sussex from Underground Sources: W. Whitaker and C. Reid (London).—Royal Geographical Society Year-Book and Record, 1899 (1 Savile Row).—Report of the Meteorological Council for the Year ending March 31, 1898, to the President and Council of the Royal Society (London).

SERIALS.—American Journal of Science, March (New Haven).—Himmel und Erde, March (Berlin).—Bibliography of the more Important Contributions to American Economic Entomology, Pt. 6 (Washington).—Journal of the Institution of Electrical Engineers, March (Spon).—Proceedings of the Royal Society of Edinburgh, Vol. xxii. pp. 249-360 (Edinburgh).—American Naturalist, March (Ginn).—Popular Astronomy, March (Northfield, Minn.).—Zoologist, March (West).

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