IT is announced in *Science* that at the recent Convocation of the University of Chicago, President Harper acknowledged a gift of 1000*l.* for special investigation in the department of physics, by the president of the board of trustees, Mr. Martin A. Ryerson, and a gift of 2000*l.* by Miss Helen Snow as a memorial to George W. Snow, her father, to rebuild the horizontal telescope at Yerkes Observatory, which was injured by fire.

AMONG the many educational enterprises of the Lancashire County Council, the system of technical instruction for fishermen, which is being much appreciated by the fishermen along the Lancashire coast, deserves special comment. The county council has arranged for batches of fifteen fishermen at a time to attend at the Piel (Barrow) Hatchery and Marine Laboratory to be instructed in the habits and conditions of breeding of various kinds of fish. The course lasts a fortnight, during which time the fishermen reside at Piel. The county council allows each man 5*l.* towards his expenses. We have received from Prof. W. A. Herdman, F.R.S., a copy of the syllabus of the lessons in marine biology given in these practical classes, and it shows that in addition to an introductory course, time is found for the fishermen to dissect and study the mussel, shrimp, crab, cockle, oyster, and fish parasites, and also to become acquainted with the leading facts about the breeding of these and other forms of life. Such courses of work as these must be of great value to fishermen.

IN his presidential address to the British Association last year, Sir Norman Lockyer used the two-power principle by which our naval expenditure is determined to illustrate and emphasise his appeal for State aid for universities equivalent to any two nations commercially competing with us. Recognising that universities are the chief producers of brain-power, and therefore the equivalents of battleships in relation to sea-power, examination was made of the provision for university education in Germany and the United States and that existing in this country. The result showed clearly that "instead of having universities equalling in number those of two of our chief competitors together, they are by no means equal to those of either of them singly." In connection with this comparison, it is of interest to notice that in answer to a question asked in the House of Commons last week, the average annual cost of maintaining in commission a first-class battleship of about 13,000 tons was stated to be, in round numbers, 94,000*l.* The State contribution to the whole of our universities and colleges amounts to about 156,000*l.* a year, that is, less than the sum required to keep two battleships in commission.

IN a dedication address at the opening of Palmer Hall, Colorado, Prof. S. Lawrence Bigelow dealt with the growth and function of the modern laboratory. The address is printed in *Science* of April 22. Eighty years ago, said Prof. Bigelow, there was not, in any country, a single laboratory for the purpose of teaching chemistry, though, of course, the subject had been taught for many years by means of lectures forming a recognised part of a medical course. To Liebig, at Giessen, belongs the credit of establishing the first chemical laboratory ever opened to students in a university. This was soon after 1824, the year in which he began his work at Giessen. So far as the foundation of laboratories in America is concerned, the address states that chemistry was taught in the laboratory in the medical department of Harvard University at an early date, and in 1846 a new medical school was built, the basement of which was devoted to a chemical laboratory capable of accommodating 138 students. At Yale Prof. B. Silliman and his son established a laboratory of analytical chemistry, and it became of sufficient importance to be incorporated as part of the university in 1847. The University of Michigan is generally recognised as being the first to introduce the laboratory method in teaching. A building exclusively for the teaching of chemistry was finished in this university at a cost of 1200*l.*, including the equipment, and was in use in 1856. But, as Prof. Bigelow remarked, it would be harder to find a university without moderately good laboratories to-day than it was to find one with them in 1850. The concluding sentences of the address will appeal to all men of science:—"Our laboratories have overwhelmingly justified their cost by their past history, and are justified in making greater demands than ever, by the importance of the functions which they fulfil. It is to be hoped that philanthropists will be still more liberal than they have been, and that the people will tax themselves more than they ever have, through their legislatures, to give to all schools, colleges and universities. Such money is the fire insurance and the life insurance of society as a whole, guaranteeing the maintenance of law and order, and the ability of the next generation to support the burden of advancing civilisation, when its turn comes."

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, February 25.—"On the Compressibility of Solids." By J. Y. **Buchanan**, F.R.S.

The solids dealt with in this research are the metals platinum, gold, copper, aluminium, and magnesium. Their absolute linear compressibilities were directly determined at pressures of from 200–300 atmospheres at temperatures between 7° and 11° C. The determinations were made by the same method, and with the same instrument which the author used for the determination of the compressibility of glass in 1880 (Roy. Soc. Edin. *Trans.*, vol. xxxix. p. 589).

The instrument consists essentially of a powerful force pump and a tubular receiver to take the samples of metals to be experimented on. These must have the form of rod or wire. The steel tube which forms the receiver has a length of 75 inches and an internal diameter of 5/16 inch. It is closed at each end by thick glass tubes having a bore of between one and two millimetres. In the present investigation the metals were all used in the form of wire (No. 22 S.W.G.). Inside the steel tube they are supported in an axial position by an internal concentric tube, and their ends project into, and are visible through, the glass terminals. Each glass terminal is commanded by a microscope with micrometer eye-piece and standing on a substantial platform, altogether independent of the rest of the apparatus. When the wire is properly placed in the receiver and the microscopes are in position, the pressure is raised to the desired height, as indicated by the manometer, and the ends of the wire are observed and their positions with reference to the micrometers noted. The pressure is then carefully relieved, and a displacement of both ends is seen to take place and its amplitude is measured. The sum of the displacements of the ends, regard being had to their signs, gives the absolute expansion of the wire in the direction of its length, when the pressure on its surface is reduced by the observed amount, and consequently also the compression when the process is reversed. From this the linear compressibility is at once obtained. If the mass of the wire be isotropic, then its cubic compressibility is obtained by multiplying the linear compressibility by three. The wires used were all well annealed before the experiment, with the exception of the magnesium.

In order to bring the ends into a suitable position for observation with the microscopes, the length of the wire had to be between 75 and 75·5 inches. The actual length was measured exactly in each case, and it averaged 75·32 inches (1·913 metres).

The manometer which indicates the pressure in the instrument is simply a mercurial thermometer with a very thick bulb. The scale on it is an arbitrary one, and its value as a measure of pressure is fixed by observing its reading in comparison with the principal piezometer which was used by the author during the voyage of the *Challenger*. The standard of pressure is therefore an open-air column of sea-water of known properties. The micrometers in the eye-pieces of the microscopes were standardised by reference to a stage micrometer which was verified at the National Physical Laboratory. Their values were very nearly equal, with the powers used. One division in the eye-piece corresponded to 0·000422 and 0·000417 inch respectively on the stage, or to about 1/180000 of the length of the wire.

In the paper the results for each metal are given in a separate table. It will be sufficient to reproduce the summary, Table I. In it the compressibilities of English

flint glass and of the glass of which ordinary German tubing is made, as well as that of mercury, have been included for purposes of comparison. The compressibility of mercury rests upon a large number of observations made in the *Challenger* (Chem. Soc. *Journ.*, 1878, vol. xxxiii. p. 453).

Table I.—Summary.

Substance	Year	Atomic Weight	Density	Compressibility	
				Linear	Cubic
Platinum	1904	194	21·5	0·1835	0·5505
Gold	,,	197	19·3	0·260	0·780
Copper	,,	63	8·9	0·288	0·864
Aluminium ...	,,	27	2·6	0·558	1·674
Magnesium ...	,,	24	1·75	1·054	3·162
Mercury	1875	200	13·6	1·33	3·99
Glass, flint ...	1880	—	—	0·973	2·92
,, ,, ...	1904	—	2·968	1 02	3·06
,, German	,,	—	2·494	0 846	2·54

It is pointed out that the number of metals experimented on is too small to permit any confident generalisation.

It will, however, be observed that in the case of the five metals used as wire, their compressibility increases as their density and atomic weight diminish, yet there is no reason to suppose that the compressibility is a continuous function of the atomic weight, like the specific heat. Mercury, although in the fused state, shows this clearly. But besides this, it happens that two pairs out of the five metals, namely, platinum-gold and aluminium-magnesium, are contiguous in the atomic weight series, yet the compressibility of magnesium is, roughly, double that of aluminium, and the compressibility of gold is half as much again as that of platinum. If, however, we compare gold and copper, which occupy parallel positions in Mendeléeff's scheme, we see that they are very much alike, and the same holds with regard to magnesium and mercury, which occupy a homologous position. If these facts indicate anything more general, we should expect the metals of the palladium and iron group to have a low compressibility like platinum, zinc and cadmium to have a very high compressibility like magnesium, and thallium an intermediate but still considerable compressibility like aluminium.

It will be observed that the two kinds of glass mentioned in Table I. are more compressible the greater their density. This may, however, be due to a specific feature of the oxide of lead which enters largely into the composition of the flint glass.

Referring to the use of glass exposed to high internal pressure, the author says:—In the work connected with this paper, which extended over the greater part of four weeks, fifteen glass terminals gave way, and oddly enough, the failures were as nearly as possible equally distributed between the two ends; eight of them fell to the left arm and seven of them to the right arm. The bursting of a terminal causes no inconvenience beyond the trouble of replacing it, because the construction of the instrument enables air to be completely excluded from it, and the quantity of water in it to be kept within such limits that its resilience is of no account. When a tube bursts it usually splits longitudinally up the middle into two slabs. One of these almost always remains entire; the other is sometimes broken into fragments, but there is never any projection of material unless the instrument has been carelessly put together and air admitted. The paper concludes with an account and an illustration of some curious *microseismic effects* produced on the wires by the explosion of the glass terminals.

Geological Society, April 13.—Dr. J. E. Marr, F.R.S., president, in the chair.—The discovery of human remains under the stalagmite-floor of Gough's Cavern, near Cheddar: H. N. **Davies**. Gough's Cavern opens at the base of the cliffs on the south of Cheddar Gorge. Human and animal remains have been discovered at different times. The principal deposits are a stalagmite-like travertine overlying cave-earth. When excavating part of a fissure running northward a human skeleton was discovered, associated with flakes, scrapers, and borers of flint, embedded in cave-earth. The remains of the skeleton excavated comprise the skull, the bones of an arm, a leg, and part of the pelvic girdle. The other bones were allowed to remain *in situ*, and may now be seen. The position of the skeleton was that which would have been assumed by a drowned man. Interment is unlikely, because of the shape of the fissure, which was choked up with débris and calcareous deposits. The stature of the man was 5 feet 5 inches; he was of muscular build, with prognathous jaws, a straight thigh, a platycnemic tibia, and a thick dolichocephalic skull. The animal remains found in the cave-earth of other parts of the cavern are those of mid- and late Pleistocene age, and this evidence, together with that derived from the position and character of the skeleton, and the workmanship of the flakes, points to a period towards the close of the Palæolithic or the opening of the Neolithic age.—History of volcanic action in the Phlegræan Fields: Prof. Giuseppe **De Lorenzo**. The author recognises three chief periods in the volcanic history of the district:—(1) The eruptions which took place under the sea during the Pleistocene period. Their surviving products can be grouped in two divisions. The older of these (*a*) is represented by the piperno and grey pipernoid tuffs of the Campania. These deposits consist of grey trachytic tuff, with scattered black scoriæ, and with a varying proportion of non-volcanic sediment. The vents whence they were ejected are now no longer to be traced. The author is disposed to regard the piperno as a trachytic lava with schlieren, the dark lenticles being made up of such minerals as augite, ægirine, and magnetite, while the lighter matrix is felspathic (anorthose) with a spherulitic structure and microliths of ægirine and augite. The second phase (*b*) of the first eruptive period is represented by ashes, lapilli, pumice, and sands, intercalated with marine shell-bearing clays and marls, and also with conglomerates and breccias. (2) Above the records of the first volcanic period lie those of the second—the yellow tuff, which forms the most characteristic of the volcanic formations of the Phlegræan Fields. It is a yellow, compact, well stratified aggregate of trachytic detritus, through which are scattered fragments of tuff and lava. Its average thickness exceeds 300 feet. It was a submarine accumulation. Owing to the uniformity of its lithological characters, this tuff has not furnished evidence of a definite order of succession in the eruptions to which it was due. It is possible to recognise vents from which the tuff was discharged. (3) After the discharge of the yellow tuff the volcanic tract appears to have been upraised into land, and to have been exposed to a period of subaërial denudation. Vents made their appearance and discharged fragmental materials, differing from the tuff in showing a greater variety of composition, and in the proofs which they furnish of a succession of eruptions, and a gradual southward shifting and diminution of the eruptive energy. The largest and most ancient of the volcanoes of this latest period is that of Agnano. Not improbably it was from this eruptive centre that the trachy-andesitic lava of Caprara issued. The crater-lake of Avernus belongs to the latest group, and perhaps it was the water percolating from this basin to the thermal springs of Tripergole which, in September, 1538, gave rise to the explosion that built up Monte Nuovo—the youngest of the cones of the Phlegræan Fields.

Entomological Society, April 20.—Dr. F. A. Dixey, vice-president, in the chair.—Mr. M. **Jacoby** exhibited a ♂ specimen of the beetle *Sagra senegalensis* with ♀ characters, received from Mr. Barker in Natal.—Dr. Norman **Joy** exhibited *Orochares angustata*, Ev., taken at Bradfield, Berks., in December, 1903—the second recorded British specimen; a species of Tychius, which he said might be a variety of *Tychius polylineatus*, Germ. (not now included in the British list), or, more probably, a new species closely allied to it, taken near Streatley, Berks., last year; and two specimens of *Pselaphus dresdensis*, Herbst., taken near Newbury this year.—Mr. C. O. **Waterhouse** exhibited an unnamed species of Nemoptera from Asia Minor, resembling *Nemoptera huttii* from Australia.—Mr. F. **Enock**

read a paper on nature's protection of insect life, illustrated by colour photography, and exhibited a number of lantern slides.—Mr. P. I. **Lathy** communicated a paper on new species of South American Erycinidæ.—Major Neville **Manders,** R.A.M.C., communicated some breeding experiments on *Catopsilia pyranthi,* and notes on the migration of butterflies in Ceylon.—A discussion followed on specimens of the dipterous families Stratiomyidæ to Crytidæ, opened by Mr. G. H. **Verrall,** who said the object of the discussion was to determine the number and distribution of the British species comprised in these families. Colonel J. W. Yerbury said that on behalf of Prof. Poulton he had been asked to exhibit some specimens the interest of which mainly lay in the specific names used, which names were useful as showing the nomenclature employed by a past school of dipterologists, and might give a clue to the manner in which some reputed species have found their way into the British list. He directed special attention to *Ephippiomyia ephippium,* an insect reputed to have been taken at Combe and Darenth Woods, but which was without doubt of German origin; *Isopogon brevirostris,* probably the identical specimen referred to in Curtis's "British Entomology" as having been taken on The Devil's Ditch, Newmarket; and *Laphria marginata,* stated to have been bred from a hornet's nest. Mr. Colbran J. Wainwright, exhibiting two specimens of Anthrax, said that hitherto Mr. Verrall had believed that we had lost two certain species of Anthrax in this country, *A. fenestratus* and *A. paniscus.* His two specimens, though allied to *A. paniscus,* were abundantly distinct. One had been taken by Mr. R. C. Bradley at Bournemouth, the other by Mr. W. G. Blatch at Poole, but at present no name could be given to the species.

Chemical Society, April 20.—Prof. W. A. Tilden, F.R.S., president, in the chair.—The following papers were read:—The vapour density of hydrazine hydrate: A. **Scott.** The author finds that at 98°·8 the vapour density is 15·8 instead of 25 as required by N_2H_6O; at 138° the dissociation into $N_2H_4+H_2O$ is complete, and at higher temperatures a certain amount of decomposition into nitrogen, ammonia and water occurs.—The combining volumes of carbon monoxide and oxygen: A. **Scott.** The results of the author's experiments indicate that the molecular concentration of carbon monoxide is slightly greater than that of oxygen, the combining volumes being CO : O : : 1·9985 : 1 with carbon monoxide from calcium oxalate, and 1·9994 : 1 with that from formic acid.—A revision of the atomic weight of rubidium: E. H. **Archibald.** The mean values of the atomic weight of rubidium obtained from fourteen analyses were 85·490 and 85·484 from the ratios AgCl : RbCl and Ag : RbCl respectively. Analyses of rubidium bromide led to the value 85·483, obtained from either of the ratios AgBr : RbBr or Ag : RbBr.—Experiments on the synthesis of the terpenes, part i., synthesis of inactive terpineol, dipentene and terpin hydrate: W. H. **Perkin,** jun. Pentane-$\alpha\gamma\epsilon$-tricarboxylic acid, when digested with acetic anhydride and subsequently distilled, is converted into δ-ketohexahydrobenzoic acid. The ester of this acid reacts readily with magnesium methyl iodide, yielding *cis*-δ-hydroxyhexahydro-*p*-toluic acid, which with fuming aqueous hydrobromic acid is converted into δ-bromohexahydro-*p*-toluic acid, which in turn yields Δ^3-tetrahydro-*p*-toluic acid when heated with pyridine and sodium carbonate. The ester of the latter with an excess of magnesium methyl iodide yields terpineol. From the synthetic terpineol so obtained dipentene and terpin hydrate were readily prepared in the normal manner.—A lævorotatory modification of quercitol: F. B. **Power** and F. **Tutin.** The lævorotatory modification described by the authors was obtained from the leaves of *Gymnema sylvestre,* a plant belonging to the family Asclepiadaceæ, and indigenous to Banda and the Deccan Peninsula.—The constituents of the essential oil of Californian laurel: F. B. **Power** and F. H. **Lees.** The Californian laurel, *Umbellularia californica,* yields an essential oil with a pale yellow colour and an odour at once aromatic and irritant. It was found to contain eugenol, *l*-pinene, cineol, safrole, eugenol methyl ether, veratric acid, and a new, unsaturated, cyclic ketone, *umbellulone,* $C_{10}H_{14}O$. To the last of these the peculiar pungency of the oil is due.—Some derivatives of umbellulone: F. H. **Lees.** A description of derivatives of umbellulone.—Ammoniacal double chromates and molybdates: S. H. C. **Briggs.** The compounds

$$CuCrO_4,3\tfrac{1}{2}NH_3,\tfrac{1}{2}H_2O;\ CuMoO_4,2NH_3,H_2O;\ CuWO_4,4NH_3 \text{ and } ZnWO_4,4NH_3,3H_2O$$

have been prepared and are described in the paper.—The hexahydrated double chromates. Magnesium and nickel compounds: S. H. C. **Briggs.**—Bornylcarbimide: M. O. **Forster** and H. M. **Attwell.** A description of this and related substances.—Reduced silicates: C. **Simmonds.** The substance left when lead silicates are reduced by heating in hydrogen is shown to be a compound which can be regarded as a combination of the metal and silica, in the same sense as the original silicate is a combination of the metallic oxide and silica. Similar results were obtained with the silicates of copper, iron, nickel and cobalt.—Picryl derivatives of urethane and thiourethane: J. C. **Crocker** and F. H. **Lowe.** The authors show that the reaction between picryl chloride, thiocyanates and alcohols is due to the formation of the ψ-thiourethanes of the type PiN : C(SH).OX as intermediate products, which subsequently react with picryl chloride and pass into the picriminothiocarbonates PiN : C(SPi).OX.—The oxime of mesoxamide and some allied compounds, part iii., tetrasubstituted derivatives: M. A. **Whiteley.** A description of a number of these compounds is given.

Royal Microscopical Society, April 20.—Dr. Hy Woodward, F.R.S., vice-president, in the chair.—A large tank microscope, made by Thomas Ross, presented to the society by the committee of the Quekett Microscopical Club, was exhibited. It was made not later than the year 1870, and was designed for the purpose of examining objects contained in aquaria.—The annual exhibition of pond life was given this evening by fellows of the society, assisted by members of the Quekett Microscopical Club.

PARIS.

Academy of Sciences, May 2.—M. Mascart in the chair.—The action of terrestrial magnetism upon a tube of nickel steel (invar) intended for use as a geodesic pendulum: G. **Lippman.** The alloy of nickel and iron known as *invar,* which possesses a coefficient of expansion only one-twentieth that of brass, has obvious advantages for pendulum observations. This steel, however, is magnetic, and it was thought possible that the disturbing influence introduced in this way might be too large to be neglected. The magnetic moment of a tube of this material was determined, and the possible error on a pendulum observation calculated. It was found to be negligible, and hence invar can be advantageously substituted for brass in the pendulum.—The effect of small oscillations of the external action on systems affected with hysteresis and viscosity: P. **Duhem.**—Geodesic and magnetic work in the neighbourhood of Tananarive: P. **Colin.**—Polyvalent antipoison serums. The measurement of their activity: A. **Calmette.** The antihæmolytic power is a measure of the antitoxic power of a serum, and a method is described by which the former can be determined in glass.—Observations of the Brooks comet (1904 *a*) made with the bent equatorial at the Observatory of Lyons: J. **Guillaume.**—On a new apparatus for measuring the power of motors: Ch. **Renard.** The axle of the motor is connected to a bar carrying two aluminium vanes, the latter being capable of adjustment as regards their distance from the axis. This having been previously calibrated against a dynamometer, the determination of the horse-power of a motor is reduced to the determination of the angular velocity.—The Adolphe bridge at Luxembourg (1899–1903): M. **Séjourné.**—On the comparison of spectro-photometric determinations: P. **Vaillant.**—The sensibility of the azimuth balance: V. **Crémieu.** An extension of the theory of the azimuth balance, a description of which has been given in an earlier paper.—On the *rôle* of the centrifugal force component in the determination of the sense of rotation of cyclones and water vortices: Bernard **Brunhes.**—On the electrolytic solution of platinum. A new method for preparing platinocyanides: André **Brochet** and Joseph **Petit.** When platinum is used as the anode in a solution of potassium cyanide, it remains unattacked. With an alternating current the platinum is readily attacked, a

current density of 20 to 80 amperes per square decimeter dissolving from 0·4 to 0·6 gram per ampere hour. With barium cyanide, barium platinocyanide is formed by the action of the alternating current; the yield of the platinocyanide is good.—The origin of the Blondlot rays given off during chemical reactions: Albert **Colson.** Chemical reactions in which Blondlot rays are given off are always accompanied by physical actions, such as contraction or cooling.—On cacodylic acid and amphoteric bodies: P.-Th. **Muller** and Ed. **Bauer.** Different physicochemical methods all lead to the same conclusion, that cacodylic acid and its sodium salt have the same constitution; it follows that an amphoteric body is not necessarily a pseudo-acid.—The reduction of silica by hydrogen: A. **Dufour.** Silica is reduced at a high temperature by hydrogen, water and hydrogen silicide being formed. The inverse reaction is possible. This reduction explains the phenomenon of devitrification of silica tubes when heated in the blowpipe, and also gives a satisfactory explanation of the experiments of Boussingault and of Schutzenberger on the formation of the silicide of platinum by silica at a distance in a current of hydrogen.—On the zinc aluminium alloys: Hector **Pécheux.** By treating zinc with aluminium in various proportions, nine different well defined alloys have been obtained, the physical and chemical properties of which are described.—The action of diazobenzene chloride upon diphenylamine: Léo **Vignon** and A. **Simonet.** Phenyldiazoamidobenzene is obtained in this reaction.—On allyl and propenyl-alkyl ketones: E. E. **Blaise.**—The application of the Grignard reaction to the halogen esters of tertiary alcohols: L. **Bouveault.** By carefully regulating the temperature the chloride of tertiary butyl alcohol reacts normally with magnesium; the product absorbs carbon dioxide, giving pivalic acid. The reaction with ethyl formate was also studied.—On the symmetrical dichloromethyl ether: Marcel **Descudé.** Trichloride of phosphorus and polyoxymethylene react on heating in the presence of a little zinc chloride, giving a good yield of the above substance.—On a method of isolating cytoplasmic substances: Maurice **Nicloux.**—New researches on aucubine: Em. **Bourquelot** and H. **Hérissey.**—Abnormal hybrids: C. **Viguier.**—On the biology of *Sterigmatocystis versicolor*: Henri **Coupin** and Jean **Friedel.**—A food substance obtained from the pith of the Madagascar palm: R. **Gallerand.** The flour made from this palm is distinguished by its richness in albumenoid matter, of which it contains 10·5 per cent.—On the presence of tin in the department of Lozère: Marcel **Guédras.**—Nervous oscillations studied by means of the *n*-rays emitted by the nerve: Augustin **Charpentier.**—The modifications undergone by the digestive apparatus under the influence of diet: Camille **Spiess.**

DIARY OF SOCIETIES.

THURSDAY, MAY 12.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—If the discussion on Messrs. Merz and McLellan's paper is concluded at the meeting of May 5, Messrs. Parsons, Stoney and Martin's paper on the Steam Turbine as applied to Electrical Engineering will be read and discussed.

MATHEMATICAL SOCIETY, at 5.30.—Some Mathematical Instruments: C. Cooke (communicated by Major P. A. MacMahon).—On the Evaluation of Certain Definite Integrals by Means of Gamma Functions: A. L. Dixon.—Generalisations of Legendre's Formula

$$KE'-(K-E)K'=\tfrac{1}{2}\pi:$$

A. L. Dixon.—Note on the Integration of Linear Differential Equations: Dr. H. F. Baker.—On Perpetuant Syzygies: A. Young and P. W. Wood.

SOCIETY OF ARTS, at 4.30.—British Grown Tea: A. G. Stanton.

FRIDAY, MAY 13.

ROYAL ASTRONOMICAL SOCIETY, at 5.—Milky Way Charts of the Heavens to Argelander's Scale 1°=20mm., with description by H. Dennis Taylor and Alfred Taylor of the Lenses and Mount: J. Franklin-Adams—Methods of Correcting Moon's Tabular Longitude: P. H. Cowell.—The Definitive Places of the Standard Stars for the Northern Zones of the Astronomische Gesellschaft: A. M. W. Downing.—Note on the Formulæ connecting "Standard Coordinates" with Right Ascension and Declination: F. W. Dyson.—*Probable Paper*.—On the Pivot Errors of the Radcliffe Transit-Circle: A. A. Rambaut.—On the new Greenwich Micrometer for Measurement of Photographs of Eros: Communicated by the Astronomer Royal.—Further Analyses of the Moon's Errors with the Mean Elongation as Argument: P. H. Cowell.

MALACOLOGICAL SOCIETY, at 8.—List of Mollusca collected during the Commission of H.M.S. *Waterwitch* in the China Seas, 1900–1903, with Descriptions of New Species: Surgeon K. Hurlstone Jones, R.N., and H. B. Preston.—On a Carboniferous Nautiloid from the Isle of Man: G. C. Crick.—Notes on the Genus Anoma: E. R. Sykes.—New Land Shells from New Zealand: Henry Suter.

MONDAY, MAY 16.

SOCIOLOGICAL SOCIETY at 5.—Eugenics; its Definition, Scope and Aims Francis Galton, F.R.S.

ROYAL GEOGRAPHICAL SOCIETY, at 3.—Anniversary Meeting: Address by the President.

TUESDAY, MAY 17.

ROYAL INSTITUTION, at 5.—Meteorites: L. Fletcher, F.R.S.

ZOOLOGICAL SOCIETY, at 8.30.—On some Nudibranchs from East Africa and Zanzibar. Part v.: Sir Charles Eliot.—Description of a new Tree-Frog of the Genus Hyla, from British Guiana, carrying Eggs on the Back: G. A. Boulenger, F.R.S.—Notes upon the Anatomy of certain Boidæ: F. E. Beddard, F.R.S.

ROYAL STATISTICAL SOCIETY, at 5.—Local Expenditure and Local Indebtedness in England and Wales: R. J. Thompson.

SOCIETY OF ARTS, at 8.—Pewter and the Revival of its Use: Lasenby Liberty.

WEDNESDAY, MAY 18.

ROYAL MICROSCOPICAL SOCIETY, at 8.—Note on Grayson's Rulings: E. M. Nelson.—Exhibition of Flower Seeds under Microscopes: C. Beck.

CHEMICAL SOCIETY, at 5.30.—Action of Nitrosyl Chloride on Pinene: W. A. Tilden.—The Electrolytic Estimation of Minute Quantities of Arsenic: H. J. S. Sand and J. E. Hackford.—The Decomposition of the Alkylureas (a Preliminary Note): C. E. Fawsitt.—The Action of Sodium Methoxide and its Homologues on Benzophenone Chloride and Benzal Chloride. Part ii: J. E. Mackenzie and A. F. Joseph.—The Formation of Periodides in Nitrobenzene Solution, II. Periodides of the Alkali and Alkaline Earth Metals: H. M. Dawson and Miss E. E. Goodson.

THURSDAY, MAY 19.

ROYAL SOCIETY, at 4.30.—The Bakerian Lecture will be delivered by Prof. E. Rutherford, F.R.S., on the Succession of Changes in Radio-active Bodies.—The following papers will probably be read in title only:—On Saturated Solutions: Earl of Berkeley.—On the Liquefied Hydrides of Phosphorus, Sulphur, and the Halogens, as Conducting Solvents. Part i.: B. D. Steele and D. McIntosh. Part ii.: D. McIntosh and E. H. Archibald.—On the General Theory of Integration: Dr. W. H. Young.

INSTITUTION OF MINING AND METALLURGY, at 8.—Miners' Phthisis—its Causes and Prevention: Dr. J. S. Haldane and R. A. Thomas.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Discussion on Messrs. Parsons, Stoney and Martin's paper, entitled The Steam Turbine as applied to Electrical Engineering.

FRIDAY, MAY 20.

ROYAL INSTITUTION, at 9.—The Radiation and Emanation from Radium: Prof. E. Rutherford, F.R.S.

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