

THE Education Committee of the London County Council has issued a report, drawn up by a subcommittee, dealing with the question of apprenticeship. A carefully thought out scheme of scholarships for particular cases is, the report states, the only effective, as well as the only legal, substitute for the old-fashioned apprenticeship premium within the reach of a local authority. The report shows that there are in London various apprenticeship charities with an aggregate income of 24,000*l.* a year, and not more than one-third of this sum has been expended in the payment of premiums. It is suggested that these funds might with advantage be devoted to technical scholarships for poorer children in higher elementary schools, or to the maintenance of boys while they are attending day technical instruction, and thus unable to earn wages. Attention is directed in the report to the lack of technical training in London, and the subcommittee urges that if the apprenticeship system is destined to disappear, it is necessary to find a substitute for such training. Scholarships tenable at evening classes, industrial scholarships at day technical classes, and at trade schools, and the part-time system by which the boy or girl spends a portion of the day in the workshop and the remainder in a day technical school, are mentioned as ways of training which will take the place of the old indentured apprenticeships.

THE scheme of training urged upon the London County Council by its Education Committee as a substitute for the apprenticeship may be summarised briefly as follows:—The intelligent boy, as he leaves the elementary school, will have offered him the choice of two courses of instruction which will assure him an all-round training in a skilled trade. There will be, first, the "part-time" system, in which he will spend a portion of the week in the workshops and the remainder in the day technical school, and, secondly, there will be evening classes. In certain cases scholarships carrying free tuition and a maintenance grant will be awarded to the day students to compensate for the small earnings received during the years of training. Other scholarships of less value will be allowed to some of the evening students in order to encourage regularity of attendance. From this class of student will be drawn the skilled worker of the future. The boy, as he leaves the higher elementary school, will be able to enter the day trade school, either by paying the fees himself or by winning one of the trade scholarships. With this stream of boys coming from the higher elementary school will mingle another stream of boys who, having completed their course at the secondary school, have competed for one of the trade scholarships. From this class of student will be drawn the future foremen and managers of industrial undertakings. Finally, a development of the senior County Council scholarships will make it possible, not only for intermediate scholars, but also for certain of the holders of trade scholarships, to proceed, for the highest technological instruction in the engineering, electrical, chemical, or other industries, to the university. From these will be drawn, we may hope, the future inventor, the future managers of large businesses, and the future "captains of industry." A somewhat less elaborate system will afford similar facilities for girls.

THE science laboratories and class-rooms at Dulwich College have long been inadequate for the demands made on them. The governors of the school, with their chairman, Lord Davey, have now, owing to the cooperation of the Estates Governors with the Charity Commissioners and the Board of Education, been able to commence the building of a new science school, the foundation-stone of which was laid with due ceremony on Saturday last by Lord Rayleigh, P.R.S. The school is to consist of two floors, the upper for chemistry, providing an advanced laboratory, a large combined lecture-room and laboratory, a junior laboratory, a separate lecture-room with preparation store, and balance rooms; the lower for physical science, and containing a senior and junior laboratory, two lecture-rooms, and a school museum. Provision is also made for a master's room, a photographic dark-room, and a small workshop. The building is being erected from the plans of the school architect, Mr. C. E. Barry. In his speech in the great hall Lord Rayleigh contrasted the old and present position of science in schools. He pointed out that scientific

spirit and method should be the aim of the teaching. In the present-day provision of elaborate apparatus and fittings things were in danger of being made too mechanical. He mentioned the simple apparatus used by Maxwell, and by Hughes for the microphone, who carried simplicity almost to an absurdity. The charms of accurate measurement were briefly touched upon. He thought there was also a tendency to try and cover too much ground in science teaching at schools; less, more thoroughly done, would be better. His own classical education was not literary enough; he was taught no English composition. Modern languages would be better than Greek for very many boys.

THE London Inter-collegiate Scholarships Board was constituted in 1904 with the approval of the governing bodies of University College, King's College, and the East London College, for the purpose of holding a combined annual examination for entrance scholarships and exhibitions tenable at those colleges. One examination has been held already, and with satisfactory results. The next examination will take place in London on May 15 and following days. The competition is limited to those who have not previously been students at any one of the colleges, except where the contrary is stated. No candidate will be admitted to the examination unless he has passed the matriculation examination of the London University, or any examination accepted by the University in lieu thereof, or is the holder of a school leaving certificate, or is able to furnish some evidence of having had a sound general education which is satisfactory to the Board. Application should be made to the secretary of the Board, University College, London, Gower Street, W.C., for forms of entry, which must be returned not later than May 1. Any scheme tending to diminish the number of examinations to which pupils in secondary schools are subjected is to be welcomed, and we trust that the schoolmasters of London will appreciate the efforts of this Board. The insistence upon the possession of a good general secondary education by the holders of scholarships at the group of colleges concerned is a step in the right direction, and it is to be hoped this example will be copied by similar institutions throughout the country.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, March 2, 1905.—"On the Electric Resistance to the Motion of a Charged Conducting Sphere in Free Space or in a Field of Force." By G. W. Walker. Communicated by Prof. A. E. H. Love, F.R.S.

November 16, 1905.—"First Photographs of the Canals of Mars." By Prof. Percival Lowell, Flagstaff Observatory, Arizona. Communicated by Sir Norman Lockyer, K.C.B., F.R.S.

With this paper the author communicates a number of photographs which undeniably prove the objective reality of the Martian canals. From a large number of photographs obtained by Mr. Lampland during May and June, 1905, five have been selected for publication, and when these are studied with the contemporaneous, yet quite independent, drawings made by Prof. Lowell, the more prominent canaliform features on the Martian disc are plainly seen.

The photographs show, so far as the grain of the photographic plate permits, that the canals are narrow and direct lines following arcs of great circles or curving in a systematic manner. There is evidence, although for the present the author does not care to assert it definitely, that both a double canal and a double oasis have been photographed.

One remarkable result that has accrued from Mr. Lampland's researches is the increased efficiency to be obtained by diaphragming down the objective, so that its effective aperture becomes equal to, or less than, the length of the atmospheric waves obtaining at the moment of observation. If the aperture is so large that more than one such wave is in front of the objective at the moment of exposure, poor definition results, caused by the consequent quiver in the rays from the planet; but if only one wave be included, the atmospheric displacement of all the rays is homogeneous, and good definition results.

In obtaining the photographs a colour screen and Cramer isochromatic plates were employed, and the camera was made movable so that numerous successive photographs might be obtained on the same plate, thereby greatly increasing the chance of obtaining at least one well defined photograph at each observation. About 700 images of the planet were secured in this way during the short time that it was favourably placed for such work during the opposition of 1905.

December 7, 1905.—“On Mathematical Concepts of the Material World.” By Dr. A. N. **Whitehead**, F.R.S.

January 25.—“Galvanic Cells produced by the Action of Light.—The Chemical Statics and Dynamics of Reversible and Irreversible Systems under the Influence of Light.” (Second Communication.) By Dr. Meyer **Wilderman**. Communicated by Dr. Ludwig Mond, F.R.S.

February 15.—“The Chemical Constitution of Proto-plasm as shown by the Rate of Tissue Disintegration.” By Dr. H. M. **Vernon**.

If a kidney be perfused with saline solution for five to eight days, it is found that from 28 per cent. to 60 per cent. of the tissues pass into solution. These constituents consist of proteid and proteid disintegration products, and contain a good deal of the peptone-splitting ferment erepsin. Sometimes the passage of the kidney tissue from life to death is quite gradual, with no accompanying disintegration. At other times it takes place suddenly, and the proteid and ferment washed out of the kidney may very quickly increase four- to twenty-fold, and then dwindle away again. Sudden and very marked disintegration is invariably produced by adding ether or chloroform to the perfusion liquid. Sudden death produced by perfusion with NaF does not lead to any sudden disintegration. The rate of disintegration is extremely responsive to changes in the perfusion liquid, e.g. substitution of 1 per cent. saline for 4 per cent. saline caused a thirty- to sixty-fold increase in the disintegration both of ferment and proteid groups. On the other hand, if already perfused saline were sent through the kidney a second time, the proteid disintegration might be diminished to a seventh its previous value, but the ferment disintegration increased even twenty-fold.

After the first few hours' perfusion, a roughly constant amount of nitrogen continues to break away from the tissues in a non-proteid form, though the proteid breaking away at the time may vary as 1 to 1300. It is produced by autolysis. Almost the whole of the nitrogen is present in the tissues as potential proteid, and may be made to break off as actual proteid; but if the kidney be perfused with saline containing 0.1 per cent. of lactic acid—which has no action on ordinary proteid—more than half the unstable potential proteid of the tissues is split up.

These results seem to indicate that the difference between living and dead tissues is one of degree rather than of kind, for the dead tissues show great lability, and their self-decomposition is greatly augmented by stimuli.

Anthropological Institute, February 13.—Prof. W. Gowland, president, in the chair.—Two clay images used by the A-Kikuyu of British East Africa in harvest ceremonies, and a slide showing four remarkable dance armlets used by the natives on these occasions: **Secretary**. The images were about 9 inches in height, and were very rude representations of the human figure; they appear to be greatly venerated by the natives; the two specimens shown were, so far as is known, the only ones that have reached Europe.—Selection of slides showing rude stone monuments in Glamorganshire: A. L. **Lewis**. The author described the monuments at Tinkinswood, near Cardiff, the fine cromlech at St. Lythian's which bears close resemblance to that at Kit's Coty House. At Pontypridd there is a curious group of stones consisting of a rocking stone, surrounded by two circles and two small curved avenues forming the head and tail of a serpent. This group has been considered by many to be ancient, and ingenious theories have been woven round it, but Mr. Lewis was able to prove conclusively that the stones had not been in position for very much longer than fifty years. Mr. Lewis also showed slides of the dolmen at Lanyon Quoit.—Notes on Deluge legends, tracing their distribution: N. W. **Thomas**.

Linnean Society, February 15.—Dr. A. Smith Woodward, F.R.S., vice-president, in the chair.—A lantern demonstration of the developmental changes in Zoogloea: Dr. H. C. **Bastian**. Masses of Zoogloea in their early stage were first shown, in which the constituent bacteria were plainly recognisable. The growth of the masses, their alteration in appearance and in reaction to staining fluids, together with the progressive segmentation which they undergo, were revealed by other specimens. Segmentation was shown to progress until minute spherical or ovoidal units were produced. During the first three to five days, while these changes are occurring, the masses remain colourless and the ultimate segmentation units develop into flagellate Monads, or, more rarely, into equally minute Amœbæ—myriads of one or of the other of these forms appearing (all of about the same size) where a few hours before they were absent. Later, from fifth to tenth day, the ultimate segmentation units of other masses appear as aggregates of brown fungus-germs. Often the masses as a whole become brown before segmentation has much advanced, and the different stages were shown by which the bacterial aggregates are completely converted into masses of brown fungus-germs, together with the development of hyphæ therefrom. All the stages in the complete conversion of the Zoogloea masses into Monads or Amœbæ in the one case, or into brown fungus-germs in the other, are clearly recognisable, though it is impossible to say from the appearance of the masses in their early stages which of these three interchangeable forms of life will ultimately be produced.—The structure of *Isis hippuris* (Linnæus): J. J. **Simpson**. The species in question is the only one remaining in the genus, the other eighteen formerly included having at various times been removed to other genera of Alcyonaria. It is widely distributed, being found in Iceland, the Mediterranean, Indian and Pacific Oceans, though no specimen was found in the *Challenger* collections. The investigation was conducted on a series of specimens obtained by the Indian survey ship *Investigator*, from the surf-line and from 20 fathoms in the Andaman Sea.—Note on the distribution of the genus *Shortia* (Torr. and Gray): B. Daydon **Jackson**. By the aid of lantern-slides, the distribution of the genus was indicated, and various species described, with their distinguishing characters shown.

Zoological Society, February 20.—Mr. G. A. Boulenger, F.R.S., vice-president, in the chair.—A new drawing of the skeleton of the Triassic rhynchocephalian, *Rhynchosaurus articeps*, from the Keuper Sandstone of Shropshire: Dr. A. Smith **Woodward**.—Breeding experiments with Lepidoptera: L. **Doncaster** and the Rev. G. H. **Raynor**. The species used were *Angerona prunaria* and its var. *sordata*, and *Abraxas grossulariata* and its var. *lacticolor*. In *A. prunaria* the banding of the var. *sordata* was dominant over its absence in the type, but the speckling characteristic of the type appeared in the heterozygote, so that the latter was both banded and speckled. The characters appeared to segregate in the typical Mendelian manner, but in several families there was an excess of *prunaria* over *sordata*. In *A. grossulariata* the var. *lacticolor* was a Mendelian recessive, but was normally found only in the female. By pairing a heterozygote male with a *lacticolor* female, *lacticolor* males and females were obtained. *Lacticolor* male × female gave only *lacticolor*; *lacticolor* males by heterozygote females had given all males of the type, all females *lacticolor*.—Tracheophone Passeres: W. P. **Pycraft**. The author proposed to make the Tracheophone Passeres one of four great divisions of the passerine stem. The most primitive of the divisions would contain the Eurylæmidæ, Cotingidæ, and Philepitta. The second would be represented by the Tracheophonæ, the third by the Tyrannidæ and Pittidæ, and the fourth by the rest of the Passeres.—A collection of mammals made by Mr. C. H. B. Grant at Knysna, and presented to the National Museum by Mr. C. D. Rudd: O. **Thomas** and H. **Schwann**. The collection consisted of about 150 specimens, belonging to 31 species or subspecies, of which the most noticeable was Mrs. Rudd's golden mole (*Amblysomus corriæ*), the description of which had already been laid before the society. A new generic name, *Nototragus*, was applied to the grysbok, which differed from the other

members of *Raphicerus* by its possession of supplementary hoofs.—Habits of the Australian lung-fish (*Ceratodus forsteri*) as observed in the society's menagerie: Prof. B. Dean.

Royal Meteorological Society, February 21.—Mr. Richard Bentley, president, in the chair.—Report on the phenological observations for 1905: E. Mawley. As affecting vegetation, the weather of the phenological year ending November, 1905, was chiefly remarkable for the dryness and mildness of the winter months, the drought and frosts in May, the long spell of hot and dry weather in July, and an exceptionally cold period in October.—Brief discussion of the general features of the pressure and wind conditions over the trades-monsoon area: W. L. Dallas.—The dispersal or prevention of fogs: Dr. W. B. Newton.

CAMBRIDGE.

Philosophical Society, January 29.—Prof. Thomson, vice-president, in the chair.—The expansion of a gas into a vacuum and the determination of the specific heat at constant pressure for gases: G. F. C. Searle. If gas, which is initially stored in a receiver at a high pressure, be allowed to expand into an exhausted vessel, and if the temperature of the whole mass of gas be allowed again to become uniform, without any gain or loss of heat, the final temperature (t') will differ from the initial temperature (t) unless U , the energy of a gram of gas, is independent of the volume. For a gas obeying Van der Waals's equation $(p + a/v^2)(v - b) = R_t$, it is shown that, when the volume of one gram increases from v to v' , the change of temperature is given by $t - t' = a/C_v(1/v - 1/v')$. Regnault's method of determining the specific heat of gases at constant pressure is shown to be an extreme case of the Thomson-Joule porous plug experiment.—The action of radium and other salts on gelatin: W. A. D. Rudge. The author has shown that barium salts produce the same effect upon gelatin as is the case with radium salt, and concludes from his experiments that radium has no specific action upon gelatin, any result obtained being due to the action of the barium in the radium salt upon the sulphur compounds present in the gelatin.—A novel instrument for illustrating the magnetic properties of iron: A. H. Peake. In this instrument a strong magnetic field is produced by sixteen bar magnets; this field, which is normally horizontal, may be slightly inclined at will by rotating a turntable, to which the permanent magnets are attached, through a few degrees. The specimen of iron under test is very thin in proportion to its length; it is supported in a freely pivoted cradle to which a control weight and a long pointer are attached; the axis of the cradle is in the same straight line with that of the turn-table.—The susceptibility of iron in colloidal solution: E. F. Burton and P. Phillips. The paper is an account of experiments made to determine the susceptibility of a colloidal solution of iron in methyl alcohol. The susceptibility found indicates that iron in colloidal solution has much stronger magnetic properties than it would have if it existed merely as a ferric (or ferrous) salt in the solution; on the other hand, the magnetic properties are weaker than those of pure iron. The results seem to point to the conclusion that each particle in the colloidal solution consists of a core of pure iron surrounded by a layer of some compound of iron, e.g. the hydroxide.

MANCHESTER.

Literary and Philosophical Society, January 16.—Sir William H. Bailey, president, in the chair.—Behaviour of liquid films formed from a solution of saponin in water: H. Stansfield. Although saponin films have very little mobility, they are capable of becoming extremely thin. The limiting thickness of a black saponin film is comparable with that of the thinnest soap film. In the process of thinning, the saponin films exhibit a grey stage; and there are two characteristic abrupt changes in thickness, the first from the white of the first order to the grey, and the second from the grey to the black.—Battacking printing in Java: J. Allan. The process of attacking is more akin to dyeing than to printing. The white cotton is first freed from the starchy and saline matter of the "finish" by frequent washings and exposure in the wet condition

to the sun. When thoroughly dried and cut into sarong lengths it is ready to be printed. The whole fabric is immersed in a dye bath, the parts not intended to be coloured being protected by previously overlaying them with a coating of wax, placed on in such a way as to form a design. In the coarsest cloths the design is drawn in with a thick brush by the women; in those of finer quality it is stamped with a metal die by the men.—Remarks on the germinal layers of vertebrates and on the significance of germinal layers in general: J. W. Jenkinson.

January 30.—Mr. Francis Nicholson in the chair.—The origin of the salt in the sea: R. L. Taylor. The paper was a contribution to the controversy which began more than thirty years ago between Dr. Sterry Hunt and David Forbes. Hunt (whose views Mr. Taylor endorsed) contended that on the original cooling of the globe, and before the condensation of the water, the alkali metals, sodium and potassium, existed in the crust of the earth entirely as silicates, the primitive atmosphere containing the chlorine as hydrochloric acid, and also probably sulphuric acid. When the water condensed these acids dissolved in it, and the primitive ocean was thus really dilute acid. This acid, however, soon became neutralised as it vigorously attacked the silicates of which the crust of the earth was composed. The calcium and magnesium, dissolved out of the primitive rock at the same time as the alkalis, have been gradually replaced by sodium carried down as carbonate by rivers.

February 13.—Sir William H. Bailey, president, in the chair.—Report on the recent Foraminifera from the coast of the island of Delos, part iii., Lageninæ: H. Sidebottom. The writer directed attention to the points of difference that occur in the same species, and stated that some of the species found have not previously been reported from the Mediterranean. Drawings of the most interesting forms obtained were exhibited and described.

PARIS.

Academy of Sciences, February 26.—M. H. Poincaré in the chair.—Researches on some metals and minerals found in the excavations at Susa, in Persia: M. Berthelot and G. André. The objects examined come from the earliest Elamite period, earlier than 750 B.C., and analyses are given of articles of silver, copper, bronze, lead, and lead silicate.—The propagation of a movement round a centre in an elastic homogeneous and isotropic medium: study of the wave correlative to the variations in density: J. Boussinesq.—Some difficulties presented by the estimation of carbon monoxide in gaseous mixtures: Armand Gautier and M. Clausmann. Synthetical mixtures of carbon monoxide with hydrogen and air were analysed by absorption with cuprous chloride and explosion with oxygen. It was found that the absorption by cuprous chloride, even in two successive treatments, was never complete, and that measurable amounts of carbon monoxide escaped oxidation by explosion.—An important inequality in the study of quasi-waves of shock: P. Duhem.—The addition of hydrochloric acid to isobutylene oxide, $(CH_3)_2C=CH_2$: Louis

Henry. Isobutylene oxide reacts with concentrated hydrochloric acid, a new chlorhydrin, $(CH_3)_2CCl.CH_2(OH)$, being formed. The starting point for the preparation of the isobutylene oxide was the isomeric chlorhydrin, $(CH_3)_2C(OH).CH_2Cl$, prepared from monochloracetone by Grignard's reaction. The physical and chemical properties of these closely related isomers are compared.—M. Heim was elected a correspondant for the section of mineralogy in the place of M. de Richthofen.—The perpetual secretary announced the death of M. A. F. A. Bienaymé, correspondant for the section of geography and navigation.—Observations of the Brooks comet (1906a) made with the large equatorial of the University of Bordeaux: E. Esclangon.—The indeterminateness of a function of a variable in the neighbourhood of a transcendental singularity: Pierre Boutroux.—Fourier's series: Léopold Fejér.—The integrals of a differential equation in the neighbourhood of a di-critical point: H. Dulac.—The application of the analysis of Dirichlet to quadratic forms with coefficients: P. Fatou.—The theory of spectra: Ivar Fredholm.—The vibrations of an elastic body the surface

of which is at rest: A. Korn.—A particular case of the problem of *n*-bodies: Thadée Banachiewicz.—The exact significance of Carnot's principle: Louis Fredey.—Lævorotatory lactic acid: E. Jungfleisch and M. Godchot. *l*-Lactic acid is much more easily transformable than the *d*-acid into the (*d*+*l*) acid, and increased care in working is in consequence necessary. The crystallised lævo-acid melts at 27° C., at approximately the same temperature as the dextro-acid.—The cysts of *Gleosporium* and their rôle in the origin of yeasts: P. Viala and P. Pacottet.—*Stellosphaera mirabilis*, a new larva probably belonging to an abyssal form: R. Köhler and C. Vaney.—The recuperative effects of raw meat after fasting: Charles Richet. Experiments on dogs comparing the recuperative effect after fasting of cooked meat, broth, and raw meat showed that the latter food is the most efficacious.—Study of the variations in the toxicity of the contents of the small intestine: modifications of the blood: MM. Charrin and Le Play.—The tectonic of the massif of the Dent Blanche: Émile Argand.—The geology of Iférouane: R. Chudeau.

NEW SOUTH WALES.

Royal Society, December 6, 1905.—Mr. H. A. Lenehan, president, in the chair.—A method of separating the clay and sand in clay soils and those rich in organic matter: L. Cohen.—Latitude of the Sydney Observatory; appendix to a paper on the provisional determination of astronomical refraction, from observations made with the meridian circle instrument of the Sydney Observatory: C. J. Merfield. An alteration in the accepted value ($\phi_0 = -33^\circ 51' 41''.55$) is regarded as unwise until the question is more completely discussed.—Sociology of some Australian tribes: R. H. Mathews. The author stated his opinion that among the social institutions of a primitive people there is none of greater interest and value to the anthropologist than the study of these social systems. He also expressed his conviction that neither "sexual promiscuity" nor "group marriage" has ever existed among the Australian aborigines.—An undescribed species of *Leptospermum* and its essential oil: R. T. Baker and H. G. Smith. "The lemon-scented *Leptospermum*," the species described in this paper, occurs in the north coast district of New South Wales and the southern coast district of Queensland. It is a shrub attaining a height from 6 feet to 12 feet, with erect branches and small, lanceolate, ovate leaves, the flowers occurring in the axils of the leaves on the upper branchlets. The fruits measure about two to three lines in diameter. Its differentiation from described species is based on both morphological and chemical characters, although the former are alone sufficiently marked to warrant its specific rank.

DIARY OF SOCIETIES.

THURSDAY, MARCH 8.

ROYAL SOCIETY, at 4.30.—The Microscopic Changes in the Nervous System in a Case of Chronic Dourine or "Mal de Coit," and Comparison of the Same with Those found in Sleeping Sickness: Dr. F. W. Mott, F.R.S.—On the Relationship between Hæmolytic and Phagocytosis of Red Blood Cells: Dr. R. D. Keith.—Upon the Properties of an Antityphoid Serum obtained from the Goat: Dr. A. Macfadyen.

ROYAL INSTITUTION, at 5.—The Physiology of Plants: F. Darwin, For. Sec. R.S.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—A New Single-Phase Commutator Motor: V. A. Fynn.

MATHEMATICAL SOCIETY, at 5.30.—On Function Sum Theorems connected with the Series $\sum x^n/n^2$: Prof. L. J. Rogers.—On Sommerfeld's

Diffraction Problem and on Reflection by a Parabolic Mirror: Prof. H. Lamb.—On Series of Zonal Harmonics: Prof. T. J. I'A. Bromwich.

FRIDAY, MARCH 9.

ROYAL INSTITUTION, at 9.—Some Dietetic Problems: Dr. R. Hutchison.

PHYSICAL SOCIETY, at 8.—The Velocities of the Ions of Alkali Salt Vapours at High Temperatures: Prof. H. A. Wilson.—Some Experiments on Earth Currents at Kew Observatory: Dr. Harker.

ROYAL ASTRONOMICAL SOCIETY, at 5.—Preliminary Account of Flash Spectra taken August 30, 1905: Dr. S. A. Mitchell.—Note on Certain Anomalies observed in Radial Velocity Curves: Dr. Alex. W. Roberts.—The Total Solar Eclipse of January 3, 1908: Dr. A. M. W. Downing.—On the Variable Star 38, 1905, RX Andromedæ: A. Stanley Williams.—(1) Discussion of Greenwich Observations of the Sun, 1864-1900: (2) Discussion of Greenwich Observations of Venus, 1860-1900: P. H. Cowell.

MALACOLOGICAL SOCIETY, at 8.—Descriptions of twenty-seven Marine Gastropoda, and one Scaphopod, from the Persian Gulf and Gulf of Oman: J. C. Melville.—Note on *Capulus lissus*, Smith: J. C. Melville.—Mollusca from a Rainwash, 150 ft. O.D. at Harlton: Rev. R. Ashington Bullen.—Report on a Small Collection of Land and Freshwater Shells from

Uganda, with Descriptions of two New Species of Limicolaria and one of Martensia: H. B. Preston.—On New Species of Polyplacophora from South Australia: W. T. Bednall and E. H. V. Matthews.

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Design of a Two-binged Spandrel-Braced Steel Arch: R. Freeman.

SATURDAY, MARCH 10.

ROYAL INSTITUTION, at 3.—The Corpuscular Theory of Matter: Prof. J. J. Thomson, F.R.S.

MONDAY, MARCH 12.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—Recent Journeys in the Rhodope Balkans: Colonel F. R. Maunsell, C.M.G.

SOCIETY OF ARTS, at 8.—Fire, Fire Risks, and Fire Extinction: Prof. Vivian B. Lewes.

TUESDAY, MARCH 13.

ROYAL INSTITUTION, at 5.—Food and Nutrition: Prof. W. Stirling.

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Widnes and Runcorn Transporter Bridge: J. J. Webster.

THURSDAY, MARCH 15.

ROYAL SOCIETY, at 4.30.—*Probable Papers*: A Discussion of Atmospheric Electric Potential Results at Kew from Selected Days during the Seven Years 1898 to 1904: Dr. C. Chree, F.R.S.—On the Specific Heat of, Heat Flow from, and other Phenomena of, the Working Fluid in the Cylinder of the Internal Combustion Engine: Dugald Clerk.

CHEMICAL SOCIETY, at 8.30.—The Interaction of well dried Mixtures of Hydrocarbons and Oxygen: W. A. Bone and G. W. Andrew.—The Explosive Combustion of Hydrocarbons. W. A. Bone and J. Drugman.—The Occurrence of Marsh Gas amongst the Decomposition Products of Certain Nitrogenous Bases as a Source of Error in the Determination of Nitrogen by the Absolute Method: P. Haas.—Studies on Comparative Cryoscopy. Part IV. The Hydrocarbons and their Halogen Derivatives in Phenol Solution: P. W. Robertson.—The Displacement of Acid Radicles. I. Displacement of the Chloride and Nitrate Radicles: A. F. Joseph.

ROYAL INSTITUTION, at 5.—The Physiology of Plants: Francis Darwin, For. Sec. R.S.

LINNEAN SOCIETY, at 8.—Discussion on the Origin of Gymnosperms: Opened by Prof. F. W. Oliver, F.R.S.

SOCIETY OF ARTS, at 4.30.—The Languages of India and the Linguistic Survey: Dr. George A. Grierson.

FRIDAY, MARCH 16.

ROYAL INSTITUTION, at 9.—How to Improve Telephony: W. Duddell.

INSTITUTION OF MECHANICAL ENGINEERS, at 8.—*Continued Discussion*: Large Locomotive Boilers. G. J. Churchward.—*Probable Paper*: Petroleum Fuel in Locomotives on the Tehuantepec National Railroad of Mexico: L. Graeven.

EPIDEMIOLOGICAL SOCIETY, at 8.30.—Evolution in Relation to Disease: Dr. J. T. C. Nash.

CONTENTS.

PAGE

A Revised Doctrine of Valency. By Prof. A. Smithells, F.R.S.	433
The Danish Fishery Investigations. By Jas. Johnstone	434
The Evolution of Biology. By J. A. T.	435
Stomata and Phylogeny. By F. D.	436
Our Book Shelf:—	
Ries: "Economic Geology of the United States"	437
"Botanische Jahrbücher"	437
"The Practical Photographer"	437
Bashore: "The Sanitation of a Country House"	437
Letters to the Editor:—	
The Perkin Jubilee and Chemical Industries.—Sir Henry E. Roscoe, F.R.S.	438
Cooperation between Scientific Libraries.—Prof. Henry E. Armstrong, F.R.S.; Prof. Herbert McLeod, F.R.S.	438
The Bees of Australia.—Prof. T. D. A. Cockerell	439
The Intelligence of Animals.—Prof. W. Galloway	440
Result of War affected by Soldier's Stature.—John Hill Twigg	441
What is Whiskey?	441
The Royal College of Science	442
Prof. Samuel Pierpont Langley. By W. E. P.	443
Notes	444
Our Astronomical Column:—	
Discovery of a New Comet, 1906b	448
The Ring Nebula in Lyra	448
A Cluster of Nebulae in Perseus	448
Twenty-five New Variable Stars	448
The Glow surrounding the Lunar Crater Linné	448
The Vertical Distribution of the Meteorological Elements above the Atlantic. (With Diagrams.) By Dr. A. L. Rotch and L. Teisserenc de Bort	449
The Transformations of Rock-Masses. (Illustrated.) By A. H.	450
A New Oxide of Carbon	452
University and Educational Intelligence	452
Societies and Academies	453
Diary of Societies	456