

After the Congregation, the Guild of Graduates, presided over by Dr. Ethel M. R. Shakespear, entertained a number of distinguished visitors at luncheon. The Lord Mayor, in replying to the toast of "The City," expressed his regret that, at the time when the University applied to the City Council for assistance, an unusual spirit of economy seemed to be abroad. In his opinion the city was expecting a very great deal from the University in return for a comparatively small pecuniary grant. He also expressed the opinion that a great need of the city was for more university graduates on the City Council and on public bodies generally, and he heartily invited the graduates to take a more active share in municipal life, where their help would be eagerly welcomed.

Mr. Herbert Heaton has been elected to a new assistant-lectureship in economics. Mr. Heaton has studied at the University of Leeds and the London School of Economics. His services will be devoted partly to the Faculty of Commerce and partly to the extension work in connection with the Workers' Educational Association.

OXFORD.—A party of the foreign and colonial delegates to the 250th anniversary of the foundation of the Royal Society has been invited to visit Oxford on Friday, July 12. The proceedings at Oxford will include a Convocation in the Sheldonian Theatre, at which honorary degrees will be conferred; a lunch given by the Warden and Fellows of All Souls' College, and a garden-party in the grounds of Wadham College, the scene, during the Commonwealth, of some of the meetings from which the Royal Society afterwards took origin.

In view of the resignation by Prof. Odling of the Waynflete professorship of chemistry, which he has held for forty years, a committee has been appointed to collect subscriptions for the foundation of an "Odling Scholarship" for the encouragement of chemical research. Subscriptions towards this memorial of Prof. Odling's services will be received by Dr. H. B. Baker, F.R.S., Christ Church; Rev. G. B. Cronshaw, Queen's College; and Mr. H. B. Hartley, Balliol College.

EDINBURGH.—At the Graduation ceremony on July 5, the honorary degree of LL.D. was conferred upon Lieut.-Col. Bailey, formerly lecturer on forestry in the University; Prof. J. Theodore Cash, F.R.S., Regius professor of *materia medica* in the University of Aberdeen; Dr. J. S. Flett, director of the Geological Survey of Scotland; Dr. W. Warde Fowler; Prof. W. C. McIntosh, F.R.S., professor of natural history in the University of St. Andrews; Dr. R. Munro; Sir James Porter, K.C.B., Director-General, Medical Department, Royal Navy; Sir Thomas Rayleigh, formerly Vice-Chancellor of the Calcutta University; and Mr. J. L. Robertson, Chief Inspector of Schools for Scotland.

DR. S. J. M. AULD, lecturer on agricultural chemistry and head of the chemical department at the South-Eastern Agricultural College, Wye, has been appointed to the professorship of agricultural chemistry at University College, Reading.

PRESIDENT T. N. VAIL, of the American Telegraph and Telephone Co., has presented to the Massachusetts Institute of Technology the Dering library, containing a large collection of comparatively recent works on electricity, the value being estimated at about one hundred thousand dollars, and with it Mr. Vail has given some tens of thousands of dollars for its maintenance. Mr. G. E. Dering, who died in January, 1911, was more than forty years collecting his library, which was the chief hobby of his life.

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He gave an unlimited order to Mr. Nutt for all the books, in whatever language, that were offered that appertained to electricity or electrical engineering, and he collected in all about thirty thousand volumes. About three-fifths of the whole library treat of electricity, and the collection of volumes on iron and steel is also practically complete.

THE London County Council decided in 1910 that from August, 1911, the council's grants in aid of polytechnics and certain technical institutions should take the form of block maintenance grants fixed for a period of three years. The governing bodies of the ten polytechnics have each submitted applications for a block grant for the triennial period 1911-14, together with a statement of the general policy of the educational work which they propose to undertake. The governing bodies propose no new departure during this first period, but the grants applied for are nevertheless always in excess of those received in 1910-11. Each application has been the subject of careful consideration by a section of the Higher Education Subcommittee, and the grants finally decided upon are given in the following table:—

	Block grant applied for	Percentage increase over the 1910-11 grant	Grant decided upon
	£		£
Battersea Polytechnic ...	12,500	47.72	10,500
Birkbeck College ...	6,993	27.77	6,600
Borough Polytechnic ...	11,731	37.06	10,634
City of London College..	5,800	46.39	—
Northampton Polytechnic Institute ...	8,892	36.88	7,330
Northern Polytechnic ...	9,293	31.72	8,100
Regent-street Polytechnic	13,172	9.77	12,500
Sir John Cass Technical Institute ...	5,790	82.42	4,450
South Western Polytechnic ...	14,186	51.84	11,500
Woolwich Polytechnic...	13,338	36.70	10,865
Totals	£101,695		£82,479

The grant shown in column 4 is subject to slight reductions in some cases for the sessions 1912-13 and 1913-14.

## SOCIETIES AND ACADEMIES.

### LONDON.

**Royal Society**, June 27.—Sir Archibald Geikie, K.C.B., president, in the chair.—Lord Rayleigh: Electrical vibrations on a thin anchor ring.—Hon. R. J. Strutt: The molecular statistics of some chemical actions. (1) Where ozone acts on a silver oxide surface, every collision results in the destruction of the ozone molecule concerned. (2) An active nitrogen molecule must, on the average, collide 500 times with an oxidised copper surface before it is destroyed. (3) Two molecules of ozone at 100° C. must, on the average, collide  $6 \times 10^{11}$  times, before the right sort of collision occurs for chemical union.—C. V. Boys: Experiments with rotating films. An apparatus is described whereby a film may be rotated in its own plane, and in which air at atmospheric pressure above and below the film is rotated also at the same speed. Twenty experiments are described which refer mainly to the ring and spiral patterns of colour that may be produced to the development of black films and patterns and to the instability of the margin of the black.—Prof. H. E. Armstrong and E. H. Rodd: Morphological studies of benzene derivatives. III. Paradi-bromo-benzene-sulphonates (isomorphous) of the "rare earth" elements—a means of determining the directions of valency in trivalent elements. Paradi-bromo-benzene-sulphonates of lanthanum, neodymium, praseodymium, cerium, gadolinium, and sama-

rium are described.—**Karl Pearson**: The intensity of natural selection in man. The following statement has recently received much currency:—A high infant death-rate in a given community implies in general a high death-rate in the next four years of life, while low death-rates at both age-periods are similarly associated. The evidence in support of the statement is not valid; it consists solely in showing that a bad environment raises both infant and child death-rates. The statement is not true even when no correction is made for differential environment. The question of a selective death-rate is the question of whether natural selection—Darwinism—applies to man. The present paper does not determine how far a rising infant death-rate is really the cause of a falling child death-rate, but its aim is to show that there is no such general rule as that stated to hold. If that rule were a demonstrable truth, then we might confidently assert that Darwinism did not apply to civilised man. As a matter of fact, others methods of inquiry indicate that at least 60 to 70 per cent. of the deaths in civilised human communities are selective, *i.e.* due to the elimination of those with inferior constitutional powers of resistance.—**Dr. T. M. Lowry**: Optical rotatory dispersion. Part i. The natural and magnetic rotatory dispersion in quartz of light in the visible region of the spectrum.—**J. J. Manley**: The apparent change in mass during chemical reaction.—**Dr. W. H. Eccles**: The diurnal variations of the electric waves occurring in nature, and on the propagation of electric waves round the bend of the earth. The natural electric wave train radiating from a lightning discharge produces, it is well known, a disturbance in apparatus for the reception of wireless telegraph messages. Normally these disturbances form a steady stream of faint or loud clicks in the receiving telephones. The rate at which they are received at a station varies from hour to hour during the twenty-four hours, and also with the season, but as a general rule the disturbances—or “strays” as they are often called—heard at night are stronger and more frequent than those heard in the day. The change from day to night and from night to day conditions is very noticeable at sunrise and sunset. It is chiefly this transition period that is investigated in the present communication. In order to explain the phenomena the author develops a hypothesis which is based on a proposition to the effect that the velocity of electric waves through ionised air increases with increasing ionisation.—**Rev. A. L. Cortie**: Report on the total solar eclipse of 1911, April 28. Communicated by the Joint Permanent Eclipse Committee.—**W. Hamilton Wilson**: An experimental investigation of the influence of the condenser on the working of a Ruhmkorff coil, together with a practical outcome thereof.—**Prof. D. Fraser Harris** and **Dr. H. J. M. Creighton**: Studies on the reductase of liver and kidney. Part i.—**Prof. M. W. Travers** and **Ramu Chandra Ray**: Borohydrates. Part i.—**Prof. G. N. Stewart**: The specific conductivity of solutions of oxyhæmoglobin.—**J. W. Gifford**: The existing limits of uniformity in producing optical glass.—**Prof. A. C. Seward**: A petrified *Williamsonia* from Scotland.—**Prof. A. W. Porter** and **Dr. F. W. Edridge Green**: Negative after-images and successive contrast with pure spectral colours. A definite portion of the retina was fatigued by steadily gazing at an isolated region included between two definite wave-lengths in the Edridge green colour perception spectrometer. After the fatiguing light had been viewed for a period of about 20 seconds, the eye was turned to a screen on which a spectrum was situated, so that the after-image formed a band running right across the spectrum on the screen and occupying its centre. Experiments were also made with the spectrum replaced by monochromatic bands, and on the appearance of the

sodium flame after fatigue to various colours. It is held that the facts described cannot be explained on either the Hering or Young-Helmholtz theories. The explanation on the Edridge-Green theory of colour-vision is the same as that given for other facts of simultaneous contrast (*Proc. Roy. Soc., B*, vol. lxxxiv., 1912, p. 546).—**Leonard Hill** and **M. Flack**: The relation between capillary pressure and secretion. II. The secretion of the aqueous and the intra-ocular pressure.—**Prof. W. B. Bottomley**: Some conditions influencing nitrogen fixation by aerobic organisms.—**J. G. Wilson** and **F. H. Pike**: The effects of stimulation and extirpation of the semicircular canals of the ear and their relation to the motor system.—**W. Wilson**: The absorption and reflection of homogeneous particles.—**Prof. H. M. Macdonald**: The effect of an obstacle on a train of electric waves.—**Dr. Walter Wahl**: Optical investigations of crystallised nitrogen, argon, methane, and some of the simpler organic compounds of low melting points. A quartz glass vessel, holding a very thin layer (0.05 mm.) of substance between polished quartz glass plates, has been constructed. In this vessel N, A, CH<sub>4</sub>, &c., have been crystallised and investigated crystal-optically:—(1) Nitrogen crystallises in the regular system; (2) argon is regular; (3) methane is regular; (4) ethyl-ether is rhombic. Ethyl alcohol, acetone, methyl alcohol, and carbon bisulphide are monoclinic or triclinic. Methylalcohol occurs in two polymorphic forms, changing reversibly into each other.—**Sir W. de W. Abney**: Colour-blindness and the trichromatic theory. Part iv. Incomplete colour-blindness. In this communication the author shows how a simple test is capable of giving a quantitative measure of the degree of colour-blindness which a colour-blind person possesses. By matching a single colour of the spectrum with the colour of the light coming from such a solution as of chromate of potash the degree of colour-blindness can be immediately determined. Further, he gives a method by which any displacement of the green or red sensation curves can be measured with great accuracy.—**Prof. W. H. Young**: The multiplication of successions of Fourier constants.—**C. E. Haselfoot**: The diffusion of ions into gases at low pressure.—**Prof. J. S. Townsend** and **T. T. Tizard**: Effect of a magnetic force on the motion of negative ions in a gas.

## DUBLIN.

**Royal Dublin Society**, May 21.—**Mr. R. Ll. Praeger** in the chair.—**Prof. G. H. Carpenter**: Injurious insects and other animals observed in Ireland during the year 1911. Among the insects mentioned are the Diptera, *Trichocera fuscata* (injurious to swedes) and the narcissus-fly (*Merodon equestris*), the larvæ of both being described. There are records of several sawflies, including *Fenusa pumilio* on raspberry, and *Nematus erichsonii* on larch. Slugs (*Arion* and *Agriolimax*) have been observed eating the bark of the Weymouth pine.

June 25.—**Mr. R. Ll. Praeger** in the chair.—**J. J. Dowling**: Steady and turbulent motion in gases. Following Osborne Reynolds's well-known work on the flow of water through tubes, the author extends the investigation to gases, and verifies Reynolds's formula for the critical velocity at which turbulence sets in, viz.  $V_c = \frac{K \cdot \eta}{\rho a}$  (where  $a$  is the tube radius,  $\eta$  the viscosity, and  $\rho$  the density). Different gases are experimented with, and the effects of temperature examined. A new type of critical velocity is also found to exist, and is discussed. This second critical velocity is found to vary according to the equation  $(V_c - k') = \frac{K' \eta \cdot a}{\rho}$  (where  $K'$  and  $k'$  are new constants). An ionisation method is

used to detect the critical points.—Dr. J. H. Pollok: The vacuum tube spectra of some non-metallic elements and compounds. The spectra were taken with the new form of quartz vacuum tube devised by the author. Photographs were shown of the spectra of sulphur, selenium, tellurium, chlorine, bromine, iodine, and phosphorus, the chlorides and fluorides of boron and silicon, and of boron trioxide. In each case photographs were taken both with and without a Leyden jar, and extended from  $\lambda 7000$  to  $\lambda 2000$ . An examination of these photographs showed that the general conclusions arrived at by the author in regard to metals and their compounds, hold also with the non-metals. When no Leyden jar is used, bands are seen due to the molecules of either the elements or their compounds, and a larger or smaller number of lines may also be seen, according to the facility with which the molecules are decomposed at a high temperature. When a Leyden jar is introduced the bands either wholly or partially disappear, and a strong line spectrum is obtained of the element, or of each of the constituent elements of the compound, under observation.—Miss Genevieve V. Morrow: The influence of self-induction on the spark spectra of the non-metallic elements. The spark spectra of ten non-metallic elements were examined by sparking carbon or gold electrodes in an atmosphere of each of the elements or their compounds under ordinary conditions of pressure. It was shown that the effect caused by self-induction was in some cases rather remarkable. In the case of carbon and nitrogen two of the bands usually attributed to cyanogen disappeared when no self-induction was present, one alone remaining, which would tend to show that this band is due to carbon and not due to cyanogen. With hydrogen and gold electrodes the effect was very remarkable, the gold spectrum practically disappearing, and only that of hydrogen showing when self-induction was introduced, and exactly the opposite effect is produced when the atmosphere is composed of an electro negative element. All compounds when sparked, either with or without self-induction, show only the lines of the line spectra of their components, and no bands due to the compounds are seen.

## PARIS.

Academy of Sciences, July 1.—M. Lippmann in the chair.—J. Boussinesq: The reason why the differential equations of mechanics are of the second order rather than of the first; in other words, why the accelerations of material points and not their velocities are determined.—Georges Lemoine: The velocity of decomposition of hydrogen peroxide under the influence of heat. For dilute solutions the reaction is monomolecular. This is not the case for concentrated solutions, and these solutions have been investigated in detail, experimentally and theoretically.—A. Chauveau: Investigations on stereoscopic images.—M. Gouy: The continuous spectrum of metallic vapours and the solar photosphere. From the experiment described the author concludes that the parts of the sun from which we receive radiations contain metallic vapours in an extremely rarefied condition.—C. E. Guillaume: Study of the vertical movements of the Eiffel Tower. A stretched invar wire was arranged to give a record of the variation in height of the second storey (116 metres).—W. H. Young: The generalisation of Parseval's theorem.—A. Leduc: The expansion of saturated water vapour.—R. Ledoux: The electrical properties of the copper-tin alloys. Curves are given showing the resistivity and thermo-electric power of alloys containing various percentages of copper and tin.—G. Rebol: Photo-electric phenomena and the absorption of light.—Mme. Ramart-Lucas: The synthesis of  $\alpha$ -phenyl- $\beta$ -dimethylhydrocinnamic acid.

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—J. Frézouls: The catalytic addition of hydrogen to benzylidene-acetophenone: symmetrical diphenylpropane and dicyclohexylpropane.—V. Grignard and E. Bellet: The synthesis of nitriles in the cyclanic series. Bromocyclohexane is converted into the magnesium compound  $C_6H_{11}Mg.Br$ , and this in ethereal solution reacts with cyanogen, giving the nitrile  $C_6H_{11}.CN$ . The generality of the method is shown by several examples.—E. E. Blaise: Syntheses by means of mixed organo-metallic derivatives of zinc:  $\alpha$ -halogen derivatives of ketones. The method of preparing ketones of the type  $R.CHCl.CO.R$  is based upon the interactions of a chloroacetal and zinc alkyl iodide.—A. Wahl and M. Boll: Ortho- and paramethoxybenzoylglucosylic esters.—Emile André: The action of hydrazine upon the  $\beta$ -substituted ethylenic amino-ketones.—Jacques de Lapparent: The basic eruptive rocks associated with the granite of Haya.—C. Gerber: The latex of the fig, a vegetable pancreatic juice with a predominating proteolytic diastase.—Jean Daniel: A case of xenia in the bean.—L. Blanc: The influence of sudden variations of temperature on the respiration of plants. Sudden changes of temperature do not cause a stimulation of the plant respiration.—François Kövessi: The electrolytic effect of the continuous current on the cells of living plants. A continuous electric current exerts a direct influence upon living plants, and this is traceable to electrolytic phenomena.—Paul Godin: Unequal growth at the time of puberty and the pathological states which determine it.—A. Quidor: A new stereoscopic microscope with a single objective. The light bundle furnished by the objective is divided into two symmetrical portions by reflecting prisms. Much higher magnification is possible by this arrangement than with the usual double objective binocular.—Louis Lopicque: Excitability of the iterative nerves and the theory of their working.—E. Vasticar: Corti's fibres and their connections with the sensorial epithelium.—L. Camus: Passive vaccinal immunisation and serotherapy.—F. Mesnil and J. Ringenbach: The action of serums from Primates on the human trypanosomes from Africa.—M. Laveran: Remarks on the preceding communication.—Gabriel Bertrand and F. Medigreceanu: The presence of manganese in the animal kingdom. From fifty-one determinations on forty species, it is found that manganese is always present in the animal organism, the Mammalia containing this element in the smallest proportions.—A. Fernbach and M. Schoen: The biochemical production of levulose. The author has discovered an anaerobic bacillus which converts saccharose into a levulane, the latter giving levulose nearly quantitatively on hydrolysis.—Em. Bourquelot and M. Bridel: Synthesis of the glucosides of alcohols by means of emulsin:  $\beta$ -methylglucoside,  $\beta$ -ethylglucoside, and  $\beta$ -propylglucoside.—Charles Jacob and Paul Fallot: The Portland, Neocomian, and Mesozoic Rhyconella of the south-east of France.—R. Anthony: The encephalus of the fossil man of La Quina. The type approaches the anthropoids more closely than the existing human type.

## CALCUTTA.

Asiatic Society of Bengal, June 5.—Hanindra Nath Banerjee: An investigation into the Ayurvedic method of purifying mercury by *Allium sativum* or garlic-juice. A previous paper (Proc. Chem. Soc., 27, 398) describes the action of garlic-juice on metallic lead and mercury. The present paper gives the results of detailed investigations, showing that oil of garlic, while not acting on pure mercury, readily attacks lead and other impurities, forming with them a greyish-blue amorphous mass of sulphides which may

be removed. Surgeon-Captain F. F. MacCabe: Larvicides in action. The writer of this paper commences by pointing out that kerosene oil practically always fails to kill larvicides, as they manage to "take cover" from it, and even can breath through it, and he makes an exhibit to prove that it kills water-snails, which he has discovered are greedy feeders on mosquito eggs. He then relates a number of experiments made with substances likely to act as larvicides, and tells of successful results obtained by him with a paste the basis of which is chloride of lime and of other successful results obtained by passing of low-tension electric currents through the water.

### BOOKS RECEIVED.

Liverpool Marine Biology Committee. L.M.B.C. Memoirs on Typical British Marine Plants and Animals. xx., Buccinum (the Whelk). By Dr. W. J. Dakin. Pp. viii+115+8 plates. (London: Williams and Norgate.) 4s. 6d.

Chemisches Experimentierbuch. By O. Hahn. Pp. 165. (Leipzig: Quelle & Meyer.) 1.80 marks.

Unsere Wasserinsekten. By G. Ulmer. Pp. v+165. (Leipzig: Quelle & Meyer.) 1.80 marks.

Aus der Vorgeschichte der Pflanzenwelt. By Dr. W. Gothan. Pp. 184. (Leipzig: Quelle & Meyer.) 1.80 marks.

Deutschlands Bodenschätze. I., Kohlen und Salze. By L. Milch. Pp. 151. (Leipzig: Quelle & Meyer.) 1.25 marks.

Himmelskunde. By Prof. U. Marcuse. Pp. 135. (Leipzig: Quelle & Meyer.) 1.25 marks.

Handbuch der vergleichenden Physiologie. Edited by H. Winterstein. 23 Lief. Band I., 1 Hälfte, 3. 24 Lief. Band III., 2 Hälfte, 4. (Jena: G. Fischer.) Each 5 marks.

Union of South Africa. Mines Department. Geological Survey Memoir, No. 6—The Geology of the Murchison Range and District. By A. L. Hall. Pp. 186+plates. (Pretoria: Government Printing and Stationery Office.) 7s. 6d.

A Critical Revision of the Genus Eucalyptus. By J. H. Maiden. Vol. ii., pt. 4. Pp. 131-164+plates 61-64. (Sydney: W. A. Gullick.) 2s. 6d.

The Chemical Constitution of the Proteins. By Dr. R. H. A. Plimmer. Pt. i., Analysis. Second edition. Pp. xii+188. (London: Longmans and Co.) 5s. 6d. net.

Memoirs of the Boston Society of Natural History. Vol. vii., Phylogeny of the Echini, with a Revision of Palæozoic Species. By R. T. Jackson. Pp. 491+plates 76. (Boston, Mass.: The Society of Natural History.)

The Dynamics of Mechanical Flight. By Sir G. Greenhill. Pp. iii+121. (London: Constable and Co., Ltd.) 8s. 6d. net.

The Beyond that is Within and other Addresses. By Prof. E. Boutroux. Translated by J. Nield. Pp. xvi+138. (London: Duckworth and Co.) 3s. 6d. net.

Paul Drudes Physik des Aethers auf Elektromagnetischer Grundlage. Zweite Auflage. By Prof. W. König. Pp. xvi+671. (Stuttgart: F. Enke.)

The British Bird Book. Edited by F. B. Kirkman. Section IX. Pp. 413-609+plates. (London and Edinburgh: T. C. and E. C. Jack.) 10s. 6d. net.

Journal of the College of Science, Imperial University of Tokyo. Vol. xxxi., Flora Koreana. By T. Nakai. Pp. 573+xx plates. (Tokyo: The University.)

The Elements of Inorganic Chemistry. By W. A. Shenstone. Sixth edition, Edited by R. G. Durrant. Pp. xii+567. (London: E. Arnold.) 5s.

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The Application of Science to Industry. Souvenir of the Congress of the Universities of the Empire, London, 1912. Pp. 112. (London: Burroughs, Wellcome and Co.)

Allgemeine Botanik. By Prof. A. Nathansohn. Pp. viii+471. (Leipzig: Quelle & Meyer.) 10 marks.

Cambridge County Geographies: North Lancashire. By Dr. J. E. Marr. Pp. xii+180. (Cambridge University Press.) 1s. 6d.

The Testing of Wood Pulp. By Sindall and Bacon. Pp. 148. (London: Marchant Singer and Co.)

The Triuniverse: a Scientific Romance. By the Author of "Space and Spirit." Pp. xiv+221. (London: C. Knight and Co., Ltd.) 5s. net.

An Introduction to Psychology. By Prof. W. Wundt. Translated by Dr. R. Pinter. Pp. xi+198. (London: Allen and Co., Ltd.) 3s. 6d.

Memoirs of the Geological Survey. Summary of Progress of the Geological Survey of Great Britain and the Museum of Practical Geology for 1911. Pp. iv+90. (London: H.M.S.O.; E. Stanford and others.) 1s.

Vorschule der Geologie. By Prof. J. Walther. Fünfte Auflage. Pp. viii+237. (Jena: G. Fischer.) 2 marks.

Mémoires sur l'Electricité et l'Optique. By A. Potier. Pp. xx+330. (Paris: Gauthier-Villars.) 13 francs.

Bureau des Longitudes. Réception des Signaux Radio-télégraphiques transmis par la Tour Eiffel. Pp. 56. (Paris: Gauthier-Villars.) 1.75 francs.

Sub-Alpine Plants or Flowers of the Swiss Woods and Meadows. By H. S. Thompson. Pp. xv+325. (London: G. Routledge and Sons, Ltd.) 7s. 6d. net.

The Early Naturalists: their Lives and Work (1530-1789). By Dr. L. C. Miall. Pp. xi+396. (London: Macmillan and Co., Ltd.) 10s. net.

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