University, beginning on May 13; eight lectures on the physiology of photosynthesis and respiration in plants, by F. F. Blackman, F.R.S., at University College, beginning on April 23; four lectures on the physiology of absorption, by Prof. T. G. Brodie, F.R.S., at King's College, beginning on May 21; four lectures on the supposed physical basis of life and mind, by Dr. J. S. Haldane, F.R.S., at Guy's Hospital, beginning on May 8; eight lectures on the factors concerned in the volume and form changes of cells (growth and movement), by Dr. H. E. Roaf, at St. Mary's Hospital Medical School, beginning on May 5; three lectures on growth and form, by Prof. D'Arcy W. Thompson, C.B., at King's College, on May 26, 28, and 30; four lectures on recent advances in the metallurgy of copper, gold, silver, and lead, by Prof. W. Gowland, F.R.S., at the Old Royal College of Science Building, South Kensington, on April 21, 25, 28, and May 2. The lectures are for advanced students of the University and others interested in the various subjects. Admission to all the lectures except those on physiology is free, without ticket.

THE report of the Admiralty Committee appointed to inquire into the education and training of naval officers shows that the Admiralty policy of watching the results of its great educational experiment with the view of readjusting its procedure to meet any defects that may be revealed, is being consistently and carefully carried out. The recommendations of the Committee that are of most general interest may be thus summarised:—(1) That to increase the number of candidates for entry and so raise the standard of ability among those selected, a system of bursaries or reduced fees shall be established, which for not more than 20 per cent. of any entry would reduce the annual cost of the four years of training at Osborne and Dartmouth from about 110*l.* per annum to about 59*l.* per annum. (2) That the subsequent training of cadets in special seagoing cruisers before joining the fleet be reduced from eight months to four. (3) That all sub-lieutenants shall serve six consecutive months in the engine-room department and obtain an engine-room watch-keeping certificate. (4) That officers who volunteer for the engineering branch shall pass through a course of study lasting six months at Greenwich, followed by a practical course of about one year's duration at Keyham. (5) That for the higher technical and administrative engineering appointments at the Admiralty and dockyards a selection be made of a limited number of those who have qualified for the engineering branch. These officers will undergo a further two years' training at Greenwich, followed by not less than one year at sea, after which they will be eligible for special shore appointments, but will not be eligible to take military command. Changes in the training of specialists in navigation, torpedo, and gunnery are also recommended with the view of securing earlier practical efficiency in the duties to be actually performed at sea.

SOCIETIES AND ACADEMIES.

EDINBURGH.

Royal Society, March 17.—Dr. B. N. Peach, F.R.S., vice-president, in the chair.—Dr. W. S. **Bruce**: Measurements and weights of Antarctic seals taken by the Scottish National Antarctic expedition.—Dr. S. F. **Harmer** and Dr. W. G. **Ridewood**: The Pterobranchia of the Scottish National Antarctic expedition. The paper contained the description of a new species of Cephalodiscus (*C. agglutinans*), in which the colony is massive and branching, the pieces of the colony being 115 mm. in greatest length, and 55 mm. in greatest breadth. The specimens were obtained in one haul in 56 fathoms off the Burdwood Bank, south of the Falkland Islands. The Zooids, which are deep brown or black in colour, are 4·5 mm. long, and have usually nine pairs of arms, *i.e.* a greater number than in any species hitherto known. Buds are present in large numbers, being formed in the usual way on a disc at the end of a stalk of a full-grown individual.—Prof. J. **Stephenson**: Intestinal respiration in Annelids, with considerations on the origin and evolution of the vascular system in that group. The occurrence of antiperistalsis and ascending ciliary action in the intestine of aquatic Oligochæta points to the intestine being a respiratory organ in those worms. The exceptional case of the genus Chætogaster is explained by assuming the descent of existing species (which are carnivorous) from endoparasitic ancestors, the antiperistalsis and the ascending ciliary action being given up on the assumption of the parasitic habit. From a consideration of the cryptozoic habits, the nature of the vascular system, and the occurrence of intestinal respiration, the author holds that the existing Polychæts are to be regarded as more primitive than the errant forms.—Dr. J. **Ritchie** and A. J. H. **Edwards**: The occurrence of functional teeth in the upper jaw of the sperm whale. In two of seven sperm whales examined about a score of maxillary teeth, with worn crowns, projected from the surface of the gum and were clearly used in masticating. Each of the whales had an enormous pre-oral rostrum sharply truncated at the extremity.

PARIS.

Academy of Sciences, March 25.—M. F. Guyon in the chair.—Gaston **Darboux**: Minimal surfaces engendered by a variable circle.—A. **Laveran** and M. **Marullaz**: Concerning some toxoplasms of the rabbit and gondi (*Ctenodactylus gondi*). Splendore described a new protozoa (*Toxoplasma cuniculi*) affecting rabbits, and Nicolle and Manceaux have isolated a very similar organism (*T. gondi*) from the gondi of Tunis. The experiments on rabbits described by the author lead to the conclusion that the two protozoa are probably identical, although this is not yet conclusively proved.—The president announced the death of Louis Henry, correspondant for the section of chemistry.—R. **Jonckheère**: New double stars discovered at the Observatory of Lille. Since 1906 thirteen lists have been given describing the positions of 1002 new double stars of an average magnitude of 9·19.—Jules **Andrade**: New experimental researches on double spiral balance springs.—L. **Décombe**: The electronic theory of gravitation.—Mlle. Paule **Collet**: The electrical conductivity of tellurium. The direction of the crystalline axes was without effect on the resistance. The influence of pressure, of the time of passage of the current, and of the applied electromotive force has been studied, and also the residual electromotive forces in the tellurium.—H. **Buisson** and C. H. **Fabry**: The wave-lengths of the krypton lines. The krypton lines are extremely fine and permit interferences up to the order of 600,000, or even of 950,000 if the tube is cooled in a bath of liquid air, corresponding to a difference of path of 53 cm. The green and yellow krypton lines have been compared with the red cadmium line, and, taking the data given by Benoit, Fabry, and Perot for the latter, the krypton lines are evaluated as 5570·2908 and 5870·9172, with an approximation of some units in the last figure. The krypton tube has the advantage of working without heating, and the two lines can be separated with-

out the use of any apparatus for dispersion by the use of suitable absorbing solutions (didymium chloride for the yellow ray, eosin for the green ray).—M. **Dussaud**: The separation of the lighting and heating effects produced by a source of light. Instead of concentration by single lenses, a group of optical systems arranged to succeed each other automatically is used. During displacement out of the path of the rays, the system cools. In this way a separation of the heating and lighting effects is produced. Numerous applications are suggested.—Mlle. L. **Chevroton** and M. F. **Vlès**: Kinematography of the vocal chords and their laryngial annexes.—G. **Lafon**: The formation of fat at the expense of the albuminoid materials in the animal organism. The formation of fat from albuminoid material, although theoretically possible, is physiologically difficult. The nutritive value of albumin, considered as a source of energy, must be measured, not by the total energy it contains, but by the energy contained in the amount of glucose which can be derived from it.—P. **Chaussé**: The conditions of respirability of the virulent particles obtained by liquid polarisation. In experimental infection by the inhalation of liquid tuberculous virus, it is only the dried particles which are effective.—Em. **Bourquelot** and Em. **Verdon**: The reversibility of ferment actions: emulsin and β-methylglucoside. The action of emulsin upon β-methylglucoside and upon a mixture of glucose and methylglucoside shows that the reaction is reversible, the final state of equilibrium being identical in both systems.—R. **Goupil**: Researches on the phosphorus compounds formed by *Amylomyces rouxii*.—L. **Launoy** and K. **Oechslin**: Concerning secretin (Bayliss and Starling) and vasodilatine (Popielski). By repeated precipitation with absolute alcohol secretin can be obtained possessing no depressive action on the blood pressure; a depressor substance has also been isolated from the alcoholic solutions, for which the name depressine is proposed. These results are in agreement with the views of Bayliss and Starling, and opposed to those of Popielski.—Louis **Gentil**: The structure of the coast line of western Algeria.

March 31.—M. F. Guyon in the chair.—Gaston **Darboux**: Minimum surfaces engendered by a variable circle.—Emile **Picard**: A class of transcendentals generalising elliptic and Abelian functions.—J. **Boussinesq**: The existence of a superficial viscosity in the thin transition layer separating a liquid from another fluid.—MM. **Leclainche** and **Vallée**: Vaccination against anthrax. Details of a method of obtaining with certainty attenuated races of the anthrax bacillus. More than 345,000 successful inoculations have been made with this virus during the last three years.—The secretary announced the death of V. Dwelshauvers-Dery, correspondant for the section of mechanics.—M. **Amann**: Observations of the mutual occultations of the satellites of Jupiter.—Léon **Lichtenstein**: The fundamental functions of linear differential equations of the second order and the development of an arbitrary function. Application of the theory of quadratic forms to an infinity of variables.—Georges **Pólya**: A theorem of Laguerre.—M. **Barré**: A series of surfaces of which a family of lines of curvature is constituted by indeformable helices.—Henri **Bénard**: The zone of formation of alternate vortices behind an obstacle.—Ernest **Esclangon**: The motion of the support in pendulum observations.—J. **Chaudier**: The magnetic rotatory polarisation of liquefied oxygen and nitrogen.—M. de **Broglie**: The multiple images produced by Röntgen rays after traversing crystals.—Victor **Henri** and René **Wurmser**: The energy absorbed in photochemical reactions. In the three cases examined experimentally the energy necessary for the destruction of a molecule is less than the quantum of energy of Einstein.—L. **Gay**: The pressure of expansibility of normal fluids.—M. **Barre**: Combinations of cerium chloride with ammonia gas. Five definite compounds are described, all of which are decomposed by water.—A. **Saint-Sernin**: The estimation of calcium as tungstate. The determination of calcium as tungstate possesses some advantages, especially as regards its separation from magnesium.—E. **Chablay**: The preparation of the primary alcohols by reducing the esters by means of absolute alcohol and sodammonium. The ester R.CO.(OR′) is converted by this reaction into the alcohol $R.CH_2.(OH)$. Examples of the generality of the reaction are given.—A. **Duffour**: A new crystalline form of potassium bichromate.—L. **Blaringhem**: A remarkable case of heredity in hybrids of barley, *Hordeum distichum nutans* × *H. distichum nudum*.—Albert **Berthelot** and D. M. **Bertrand**: Researches on the intestinal flora. The possible production of ptomaines in acid medium. In the intestinal flora of subjects showing symptoms of enteritis or of mucocolitis, together with fœcal matter possessing an acid reaction, an organism is frequently found (*B. aminophilus intestinalis*) capable of removing the carboxyl group from histidine even in a slightly acid medium.—M. **Mansuy**: Limestones of Indo-China containing Productus.—Gustave F. **Dollfus**: The use of drainage wells. The attempt to modify the flooding of the Seine valley by borings is useless, and likely to aggravate the trouble it is intended to alleviate.

BOOKS RECEIVED.

Paläobotanisches Praktikum. By Prof. H. Potonie and Dr. W. Gothan. Pp. viii+152. (Berlin: Gebrüder Borntraeger.) 4 marks.

Modern Geography for High Schools. By R. D. Salisbury, H. H. Barrows, and W. S. Tower. Pp. ix+418+vii plates. (New York: H. Holt and Co.) 1.25 dollars.

Der Mensch und seine Kultur. By Neophilosophos Tis. Pp. 101. (Konstanz: E. Ackermann.) 3 marks.

Theorie der Erdgestalt nach Gesetzen der Hydrostatik. By Clairaut. Edited by P. E. B. Jourdain and A. v. Oettingen. Pp. 162. (Leipzig: W. Engelmann.) 4.60 marks.

Die Druckkräfte des Lichtes. By P. Lebedew. Edited by P. Lasareff. Pp. 58. (Leipzig: W. Engelmann.) 1.80 marks.

Dispersion und Absorption des Lichtes in ruhenden isotropen Körpern. By Dr. D. A. Goldhammer. Pp. vi+144. (Leipzig u. Berlin: B. G. Teubner.) 3.60 marks.

Ministry of Finance, Egypt. Survey Department. Meteorological Report for the Year 1910. Part ii., Climatological and Rainfall Observations. Pp. 199+ii plates. (Cairo: Government Press.) 15 P.T.

Examples in Algebra. By H. S. Hall. Pp. viii+168+xxxvii. (London: Macmillan and Co., Ltd.) 2*s*.

Elementary Biology: Plant, Animal, Human. By J. E. Peabody and A. E. Hunt. (London: Macmillan and Co., Ltd.) 5*s*. 6*d*. net.

Die Vererbung und Bestimmung des Geschlechtes. By C. Correns and R. Goldschmidt. Erweiterte Fassung. Pp. viii+149+plates. (Berlin: Gebrüder Borntraeger.) 4.50 marks.

Tracks of the Sun and Stars, A.D. 1900 to A.D. 37900. By T. E. Heath. Pp. 17+vi. (London: W. Wesley and Son.) 5*s*. net.

Are the Planets Inhabited? By E. W. Maunder. Pp. iv+166. (London: Harper and Brothers.) 2*s*. 6*d*. net.

The Age of the Earth. By A. Holmes. Pp. xii+196. (London: Harper and Brothers.) 2*s*. 6*d*. net.

Service Chemistry. By Prof. V. B. Lewes and