

assistant and demonstrator; in 1945 he went to Birmingham as Imperial Chemical Industries research fellow and in 1947 became a reader in theoretical metallurgy. His research work has been mainly on the structure of metals and alloys, on which he is an acknowledged authority. During the War he worked, on behalf of the Ministry of Aircraft Production, on the structure of complex aluminium alloys. Dr. Cottrell is a graduate of the University of Birmingham, and his research work has been conducted in the Department of Metallurgy. During the War he was engaged on research in connexion with the welding of armour plates. He was appointed lecturer in 1943. The Department of Metallurgy thus has, in addition to the director (Prof. D. Hanson), three other professors, namely, Prof. A. J. Murphy (who recently succeeded Prof. L. Aitchison) and the two referred to above.

George Eastman House, Rochester, N.Y.

THE George Eastman House in Rochester, New York, was opened to the public on November 9. The house has been given by the University of Rochester to George Eastman House, Inc., a corporate body of eleven directors, and is a memorial to George Eastman, who was a great pioneer in photography, particularly with regard to the development of the roll film. This public educational institute has been designed for placing on exhibition the technological developments and applications of photography, both past and present, and for aiding and encouraging research. Facilities are available for exhibitions, demonstrations, conferences, research, etc. Of particular interest are three collections furnished by the Eastman Kodak Co.; they are the collections of George Eastman himself, acquired originally from J. M. Eder of Vienna, and those of Gabriel Cromer of Paris and François Doublier. Some of the more outstanding items are cameras bearing Daguerre's signature, original prints taken by Fox Talbot in the 1840's, albums from the libraries of Victor Hugo, Napoleon III and Queen Victoria, and two original Lumière cinematographs.

Besides the display of popular material with many working models, moving displays, etc., there is at the rear of the building a hall of contemporary photography which contains many static and dynamic exhibits of interest to the more scientifically minded. Examples are shown of the photographic techniques used by men of science in investigations in the realms of nuclear physics, astronomy, X-ray and electron diffraction, and spectrography. The section on nuclear physics contains on a wall panel a big enlargement of a nuclear 'star' explosion, and to the right a three-dimensional model explaining how the explosion took place. A group of nuclear track photo-records of electrons, mesons, protons, etc., is displayed on an inclined counter under the wall panel. The role of photography in industry is also depicted with exhibits on such subjects as photo-recording, high-speed analysis, photomicrography, photogrammetry, electron microscopy, industrial radiography, graphic arts, television, microfilming, medical photography and photofluorography. Demonstrations are also given of stereo-projection and aerial photography, and map-making.

Dimensions of Animals and their Muscular Dynamics

ON November 4 Prof. A. V. Hill gave a Friday Evening Discourse at the Royal Institution, his sub-

ject being "The Dimensions of Animals and their Muscular Dynamics". He pointed out that mammals vary in size in the ratio of 40,000,000:1, from 4-5 grams to 150 tons. In general, a small animal carries out each movement more quickly than a large animal, its muscles having a higher 'intrinsic speed' and being able, in proportion to their size, to develop more power. In a group of 'similar' animals there is an evident tendency for the maximum speed, and the height and length of jump, to be independent of size. This depends upon a variety of limiting factors, particularly the mechanical strength of the structure of the animals, and the oxygen supply to their muscles. In the cetaceans, from porpoises to whales, the maximum speed that can be maintained (about 15 knots) is much the same in spite of a 5,000-fold variation of weight. A calculation of the drag due to skin friction shows that the power required to overcome it would be impossibly high if turbulence occurred over more than a small fraction of the surface.

With regard to the performance of a variety of land animals in jumping and running, high speed, together with endurance, may be obtained by economy of design, as in the gazelle; high speed, together with rapid acceleration, by a greater output of power, as in the cheetah. The maximum speeds of race-horse, greyhound and whippet are in the ratio 124:110:110, although their weights are about as 6,000:300:100. The larger animal, however, can keep up its maximum effort longer before exhaustion sets in. During maximum effort the frequency of the heart-beat of the smallest animals must be thousands per minute, of the largest animals it must lie in the twenties or thirties. Since the heart is nearly a constant fraction of the body-weight, this means that the maximum oxygen supply to a unit weight of muscle must be about in these proportions—which is why the smaller animals can exert relatively more power than the larger ones. Various points of general interest discussed by Prof. Hill were as follows: (1) he predicted that up a steep hill the speed of race-horse, greyhound and whippet would be in the reverse order to that on the flat; (2) he proposed an explanation of the fact that whales can remain for long periods under water without breathing; and (3) he showed that the characteristic relation in muscle between speed of shortening and load determines the gear ratio of bicycles for power or efficiency.

Crosby Hall: International Residence for University Women

CROSBY HALL, the international hall of residence in London for university women from all over the world, was opened in 1927 by the British Federation of University Women, which had raised more than £50,000 for the purpose of acquiring the Hall and building a residential wing. The Hall quickly became a centre for international culture and friendship where university women from every country were able to live and study, meet and exchange views, come for short visits or use the club facilities provided. Crosby Hall was requisitioned during the War but re-opened in 1946; and since this date approximately three thousand university women from forty-five different countries have resided there. The Great Hall, which dates from 1466, is the main building of the residence, and, curiously enough, it was erected originally in the City and was moved in 1909 stone by stone and beam by beam to the present site on the Chelsea Embankment. The only quali-

cation necessary for using Crosby Hall is membership of a national federation of university women, but residence is in general limited to one year, preference being given to research and postgraduate students. Members are welcomed for short visits and, accommodation permitting, university women working in London can also live at Crosby Hall. The range of nationalities, professions and interests represented at the Hall is exceedingly varied, and all who have stopped there praise the spirit of international co-operation and tolerance that prevails. The demand for accommodation is very great, and an endowment fund has been launched to build a second residential wing, a library and additional common rooms, and also to endow fellowships. The first Crosby Hall scholarship from the new fund was awarded this year to Dr. Leonor Fiorini of Buenos Aires, Argentine, who specializes in hydro-geology, and two further scholarships have been endowed—a City of London scholarship and a New Zealand one. New Zealand and Canada have each contributed £1,000 to the fund. An international sale to raise a further £4,000 will be held at Caxton Hall, London, S.W.1, on November 15, from noon to 7 p.m. (admission 1s.).

Petroleum Plant at Stanlow

A SMALL booklet, some eighty pages in length, and entitled "Britain's New Industry: Stanlow 1949", has been published by the Shell Chemical Manufacturing Co. Ltd., and describes the oil installation and refining plant at Stanlow, which was established on the south bank of the Manchester Ship Canal in 1922. The booklet deals with the production of various kinds of oils, wax cracking, ester salts ('Teepol'), and similar products and chemicals obtained from petroleum. It gives a popular account of the plant and processes, and is profusely illustrated. The cracking processes are described in outline, for example, that for the production of *iso*-propyl and secondary butyl alcohols. The uses of the products are described. The processes used in America are also outlined, such as the production from propylene of allyl chloride, which is a raw material for the manufacture of plastics and synthetic glycerol. Butylene gives butadiene, the main raw material for the manufacture of synthetic rubber. At the end of the book there is a simple scheme of the chemistry of the processes which may be of interest to elementary students of organic chemistry and to business men. The production is very lavish, many of the illustrations being in colour.

Predatory Birds of Great Britain

BELIEVING that there is a lack of knowledge throughout the country about the laws concerning the protection of wild birds, and especially the predatory birds, the British Field Sports Society has prepared a useful guide to show clearly the protection which the law affords them county by county. The book contains a clear description of each species, including measurements, range and habits, and in many cases drawings are included of the birds both settled and on the wing. It is also indicated which species, in the Society's opinion, are harmful and which are not. In the first category are those birds which, by reason of their numbers or habits, do very considerable damage not only to game birds, but also to song birds. Examples of these are the jay, magpie and sparrow-hawk. In the second category are those predatory birds such as harriers,

kites and buzzards which, either because of their habits or their rarity, do little or no damage to the game preserver or the agriculturist. The booklet also includes tables showing the protection afforded county by county according to the Wild Birds Protection Acts. The handbook may be obtained from the British Field Sports Society, 51 Victoria Street, London, S.W.1, price 3s.

Announcements

THE second Progress Medal of the Photographic Society of America has been awarded to Mr. J. Dudley Johnston, for inspiring leadership and fostering photographic societies. The Medal, which is the highest award in the gift of the Society, was received, on Mr. Johnston's behalf, by Mr. Joseph Dombroff, at the annual convention in St. Louis, on October 21. Mr. Dombroff also read Mr. Johnston's Progress Medal Lecture entitled "Photography and Progress."

PROF. HERBERT DINGLE, professor of the history and philosophy of science, University College, London, will deliver a Norman Lockyer Lecture, arranged by the University of Birmingham and the British Association for the Advancement of Science, on November 22, in the Medical Theatre, University, Edmund Street, Birmingham. He will speak on "Modern Theories of the Origin of the Universe".

THE American Association for the Advancement of Science will hold its 116th meeting in New York City during December 26-31. Dr. Edmund W. Sinnott, of Yale, is retiring president of the Association, and Dr. Elvin C. Stakman, of the University of Minnesota, is president. Dr. Howard A. Meyerhoff is administrative secretary with headquarters at 1515 Massachusetts Avenue, N.W., Washington 5, D.C.

THE British Institute of Management, 17 Hill Street, London, W.1, has arranged a conference on current industrial problems such as incentives for management in the Welfare State, minimum wages, training for management, etc., to be held at Harrogate during November 17-20. Copies of papers are being circulated in advance to afford the maximum time for discussion.

THE Commissioners for the Exhibition of 1851 are compiling a centenary edition of their "Record of Science Research Scholars", which includes the names and careers of all who have held research awards given by them. Requests for particulars of their careers have been forwarded to all Scholars for whom the Commissioners have an address; but there remain some with whom it has not been possible to get into touch. Any past Scholar who has not received the printed request should communicate with the Secretary, Royal Commissioners for the Exhibition of 1851, 1 Lowther Gardens, Exhibition Road, London, S.W.7.

A WEEK-END conference on "Secrecy in Science" is being organised by the Cambridge Scientists' Anti-War Group and will be held during November 19-20 in Lecture Room 4, St. John's College, Cambridge. The meeting on November 19 opens at 2.30 p.m., and that on November 20 at 10 a.m. The conference will be open to all who are interested, and written contributions will be welcomed.

ERRATUM. In the communication by Dr. F. G. Mann in *Nature* of November 5, p. 785, the word 'quinolino' was incorrectly printed throughout: thus the title should read "Structure and Colour in the 1:2-Dihydro-quinolino (3':2':3:4) quinolines".