

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-