tion with the movements of historical times, explains the well-known features of the present-day population.

In declaring the subject open for discussion the president, Lord Abercromby, referred to the high percentage of broad-headedness found in the Island of Borreby, and expressed a doubt as to whether, at any rate in very early times, immigrants into these islands had used the direct route across the North Sea.

Dr. J. F. Tocher dealt mainly with the modern inhabitants of Scotland. In the course of his investigations of the physical character of the Scottish people he had made observations on some 13,000 individuals in all, the data obtained including head measurement, stature, and pigmentation. He had found the average stature to be 67½ in. The cephalic index showed wide variation, the inhabitants of the north-east being broad-headed and of the south-west long-headed. In absolute size the Aberdeen head was less than that of the rest of Scotland. In the north-east there was a significantly greater proportion of red hair. Speaking generally, he deprecated any conclusion as to the origin of the Scottish people based upon physical character on the ground of the relative paucity of the data.

Prof. R. W. Reid said that as a result of a number of observations made upon the inhabitants of North-East Moray, it appeared that the average stature was 5 ft. 7½ in., while the head form was mesaticephalic, approaching broad. They were almost identical with the young men of Norway. An examination of skeletal remains of the short cist people, approximately from the same tract of country, gave a stature of 5 ft. 4 in., with a cephalic index of 85. It might be agreed that a combination of long and broad heads afforded a clue to the physical characters of the people of this part of Scotland.

Prof. Jehu said that man existed in Scotland at the time of the formation of the 45-ft. raised beach, for which the accepted date was 10,000 years ago, while in southern England Neolithic implements had been found in the submerged forest. When man entered Scotland the Highland valleys were filled with ice. Owing to lack of evidence, it was dangerous to speak of the physical characters of the "harpoon" folk. There were no data to show they came from Scandinavia. The Scottish people were a very mixed race, and more evidence was needed before any conclusion was drawn as to their origin.

In a communication from Prof. W. S. Watson, who was unable to attend on account of illness, it was argued that, although language was no criterion of race, it afforded evidence of influence, political, cultural, or economic. It was possible to trace the Celtic language in Scotland with certainty back to the fourth century B.C. The chiefs are described as uniformly fair-haired with blue eyes, like the rulers of Gaul in Cæsar's time, and as it by no means follows that all the population was of one type, they probably ruled over a dark-eyed subject people. Among non-tribal names preserved in early writings there were elements which well might be pre-Celtic.

Mr. H. J. E. Peake took exception to the loose use of the term "Nordic," which should be confined to the tall, fair-complexioned, blue- or grey-eyed people, whose chief characteristics were strength, courage, activity, and an intense admiration for the horse. Such a people were not likely to be descended from a sedentary, maritime race such as the "harpoon" folk, but must have been derived from a race which had evolved in the open spaces necessary for the taming and exercising of the horse. The Scottish people had evolved from a generalised type of long-headed people, but there was no true Nordic type until the end of the Bronze age. The leaf-shaped sword people had arrived on the east coast of Scotland about 1200 to 1000 B.C., and were in all probability the fair rulers to whom reference had been made. He had already suggested a possible Siberian origin for the "harpoon" or Maglemose folk, and had also suggested that they were responsible for the broad, possibly Mongoloid, element occurring among Scandinavian skulls. Still, they might be derived from a Palæolithic race in south-western Europe.

Prof. Fleure urged the desirability of a careful search, especially in the remoter parts of Scotland, for nests of survivals of Palæolithic types such as he had found in Wales.

Mr. D. Mackenzie pointed out the necessity for distinguishing between the Maglemose and Azilian harpoons, the former being of bone, while the latter were of horn.

An Agricultural Enterprise.

AN interesting and important development is recorded in the report under notice.[1] The Olympia Agricultural Co., Ltd., is a comparatively recent enterprise which is farming nearly 10,000 acres of land on strictly business principles, one of the first examples of the application of industrial methods to the exploitation of land in this country. The company's land lies in six estates, and, in addition, the Suffolk estate of the chairman of the company, Mr. Joseph Watson, amounting to some 7000 acres, is linked up with the operations of the research department. It is not possible here to discuss the actual operations of the company in equipping its estates, the additions to and reconstructions of the buildings in order to fit them for large-scale farming, the provision of cottages, water-supply, etc., nor, again, the stocking and management of the farms. From this purely commercial side it is evident that an experiment is being made of extraordinary value in handling English land in a wholesale instead of a retail fashion and in providing for agriculture an organisation and an equipment comparable to that appertaining to any other great industry. It has often been thought that in such a way only can intensive production and adequate labour conditions be ensured in agriculture, and the enterprise therefore becomes one of the utmost importance in our social and national economy.

The aspect of the enterprise that will, however, be of the most interest to the readers of NATURE is that the directors have from the outset been convinced of the necessity of scientific investigation in the conduct of their business. They have, therefore, set up a research department, just as a steel works includes a laboratory, and they have, further, been public-spirited enough to give to the public for the general benefit of agriculture the results of their investigations in this first annual report. The headquarters of the research department have been established on one of the company's estates at Offchurch, near Leamington, where in the old mansion a very complete equipment of laboratories, both biological and chemical, has been installed. Dr. Charles Crowther, formerly

[1] Olympia Agricultural Co., Ltd. Research Department. First Annual Report, 1921.

of the University of Leeds, and well known for his work upon the nutrition of animals and milk production, is director of the establishment, and takes charge of the work upon animal-feeding; Capt. Hunter, late of the Department of Agriculture in Ireland, is responsible for the plant-breeding work; and Capt. Gimingham, who was attached to the Research Institute at the University of Bristol, is concerned with soil problems. These heads of divisions, with twelve others, constitute the research staff.

The work set out in the report before us is necessarily of a preliminary character. The first business of a scientific establishment of this kind is to supply data for the guidance of the management. The varying soils of the estates have to be analysed and correlated with the results of manurial trials in order that the specific needs of each field as regards lime and the main elements of fertility can be defined. Variety trials of the principal crops have to be made so as to ascertain what kinds of grain and fodder crops yield best under the several conditions of soil and climate. Again, economic feeding rations have to be worked out by trial for the particular classes of livestock and the special purposes for which they are being kept. All this is not research, but the scientific control necessary to a business organisation.

Most of the present report is occupied in setting out such results, which may usefully be correlated with similar commercial trials, but do not present any essential novelty. Research is an affair of years, and wisely the director makes no promises and says nothing about the real investigations he may have initiated. It is clear, however, that new ground is being broken, particularly in connection with plant-breeding. The field bean, for example, has been taken in hand; on many soils it is a crop of considerable economic importance, which never seems to have received any serious attention from the seedsmen or the older race of plant-improvers.

The report may be obtained on application to the director at the Research Station, The Bury, Offchurch, Leamington. It is the first fruits of a movement of great promise to agriculture, and redounds to the credit of both the director and the founder of the company, Mr. Joseph Watson.

Optical Wedges.

WEDGES of tinted glass have been used for graduating light for experimental purposes during the last fifty years or so, and about five and twenty years ago Warnerke made annular wedges of pigmented gelatine. It is twenty years since the "Chapman Jones plate tester" was put on the market, the graduated portion of which is a pigmented gelatine wedge, the mould being cut into five pieces that are placed side by side for the sake of convenience. Optical wedges, therefore, have been well established as standard apparatus for a long time.

We have received from the firm of "Herlango," of Vienna (at the request of Prof. J. M. Eder) an example of "a new grey wedge photometer," called, after the names of those who have devised it, the "Eder-Hecht" photometer, the essential part of which is a pigmented gelatine wedge with a scale printed on the thin celluloid that covers its face. This, with a neatly made white wood printing frame, is the complete apparatus. The plate is 3 cm. by 16 cm., and the divisions of the scale are 2 mm. apart. But the scale is not a simple ladder. Every fifth line is numbered with its mm. distance from zero, and, in addition to the number, has on each side of it a short thick pointed swelling to emphasise it and render it more easy to see how far the light-produced image extends. For use with it the firm issues various sensitive papers, both printing out and development, a silver-chloride paper made according to the formula of Bunsen and Roscoe, and also a colour-sensitised paper. An extended table gives the relative light quantity, and also the "absolute light quantity in Bunsen-Roscoe units," represented by each 2-mm. division. Thus, given the suitable sensitive paper, the apparatus is ready for use and convenient. It is applicable to light measurement in connection with photography, meteorology, climatology, biology, light-therapeutics, agriculture, the designing of buildings, botany, photographic reproduction processes, etc. Photometers slightly varying from the above, as in steepness of gradation, length of the wedge, the character and coarseness of the printed scale, are provided when more convenient. For photographic plate sensitometry the wedge plate is 9 by 12 cm., and by the side of the ladder scale are four narrow graduated strips, red, yellow, green, and blue respectively.

Accompanying the photometer is a copy of a paper by Walter Hecht on the use of such photometers in plant culture and a copy of a paper by Prof. Eder published in the *Photographischen Korrespondenz* for September, 1919, in which he gives apparently every possible detail and formula in connection with these photometers. But he does a considerable injustice to the Chapman Jones plate tester in associating it with Warnerke's original step-tint sensitometer. It differs from the sensitometer designed by Prof. Eder in having a wedge from two to three times as long and divided into twenty-five parts instead of sixty parts. These twenty-five parts may be subdivided to any extent on mere inspection according to the observer's acuteness of vision. It has the four colours giving four definite parts of the spectrum, and, in addition, an Abney colour sensitometer, which shows at a glance whether a plate alone or a plate *plus* a colour filter gives the same density for equal brightness of several colours. We think, too, that comparing the density produced under any given colour with a scale of densities admits of greater precision than the estimation of the vanishing point of the image as is done in Prof. Eder's instrument. C. J.

The South African Association for the Advancement of Science.

DURBAN MEETING.

THE nineteenth annual meeting of the South African Association for the Advancement of Science was held at Durban, in the Technical College, on July 11–16 last, under the presidency of Prof. J. E. Duerden. The meeting was well attended, and was very successful. More than fifty papers were read, and the time-table was so arranged that attendance at the presidential address of each section was possible for every member. An official welcome and a reception in the Art Gallery was given by the Mayor of Durban, while a conversazione was arranged by the local committee of the association and the Natal