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