

which naturalists may record the distribution of species. This will probably be circulated among the various societies.

More than one member commented on the fact that this year, when the necessity for directing attention to the national value of science seemed so great, the British Association for the advancement of science had decided to have no general meeting.

THE FUTURE OF THE ENGINEERING TRADES.

THE Report of the Departmental Committee appointed by the Board of Trade to consider the position of the engineering trades after the war has recently been issued (Cd. 9973, price 6d. net).

The report relates to one of the largest and most important of the national activities. It is chiefly concerned with fiscal, commercial, and labour questions. The Committee estimates the annual net value of the output of the engineering trades, excluding the cost of materials, at 84,000,000*l.*, and the real value at 144,000,000*l.*

The Committee remarks on the smallness of many individual firms, in consequence of which they manufacture at a cost which could be greatly reduced if they were on a larger scale, well planned and well equipped; also, that adequate departments for research are necessary, but that small firms cannot bear their cost. The Committee regrets the spirit of exclusiveness which has marked the engineering trade, each manufacturer keeping his own secrets and desiring to retain the knowledge of any special processes and methods for himself.

It is urged that standardisation must be extended. For instance, locomotive manufacturers exist almost entirely on foreign trade, the great railways constructing those they require. But, except in the case of India, locomotives are not standardised, and British engineers employed by foreign railways require modifications of their own. German and American manufacturers build to stock with economy of drawings, patterns, templates, etc. The case of imports of watches is curious. The average value of imported watches from Switzerland is 6*s.* each, and the total value more than a million pounds. The British manufacturer does not seem prepared to supply a good, cheap watch.

The Committee decides against the compulsory adoption of the metric system on the grounds that the expense would be great, and that any change should be effected after agreement with the Dominions and the United States. But it recommends that subdivisions of the inch should be decimalised, and the hundredweight and ton replaced by the cental and short ton.

The recommendation that school education between the ages of fifteen and seventeen should be confined to selected boys does not go so far as Mr. Fisher's Education Bill. As to higher education, the views of the Committee are more advanced. But it is pointed out that the monetary results which can be achieved by a graduate of the technical or scientific side of a university are incommensurate with the expense incurred, and that the rewards for higher technical education are still far too small.

As to the much-discussed question of dumping, the Committee expresses a decided view. It thinks that all necessary steps should be taken to prevent dumping wherever practised, and refers with approval to the legislation in the United States and Canada.

An account is given of the German system of cartels, under which a manufacturer is able to maintain a reasonable output in bad times, and in the case of articles for export receives a rebate in price on raw

and semi-manufactured materials. Also, in Germany there are reduced railway rates on goods for export. It is urged that the Government should supervise, encourage, and assist the development of the supply of raw materials within the Empire. On the other hand, it is suggested that Government control of industries should end as soon as possible after the war; also that labour must withdraw all restriction of output and hampering definitions of skilled work. It is clear that the Committee regards the statistics of trade available in this country as imperfect.

GENETICS AND EVOLUTION.

THE problems connected with genetics and "species-making" continue to attract the attention, both in the United Kingdom and in America, of many biologists, whose papers should not be neglected by students of heredity and evolution. In the *American Naturalist* for October last (vol. li., No. 610) Dr. R. R. Gates discusses the mutation theory and the species concept. With the help of many illustrative examples he tries to show that "there are two distinct types of variability having different geographical relations." The discontinuous type, "independent of environmental or functional influence, has given rise to many specific and generic characters, notably in plants, but also in higher animals." The continuous type "apparently represents the stress of the environment on the species in its dispersal," and "is notably exemplified in birds and mammals."

An exceptionally valuable study on variation in a group of mammals is furnished by A. C. and A. L. Hagedoorn, who write on "Rats and Evolution" in the *American Naturalist* for July, 1917 (vol. li., No. 607). These authors, who have worked from the economic and systematic point of view on "the rat population of the Dutch East Indies," contend that assemblages definable as "species" or "varieties" can be appreciated only through breeding experiments and field work, the results of which must constantly be invoked to check the descriptive activities of the museum specialist, who deals with dead skins and skulls. In their breeding experiments the authors found no new dominant characters, but "in every instance there appeared new recessive characters," for every one of which, they believe, "crossing, recombination of genes was the cause, not loss-mutation."

In connection with these questions, Prof. T. H. Morgan's discussion on the theory of the gene (*Amer. Nat.*, vol. li., No. 609) is noteworthy; in the course of his argument he refers to Prof. Jennings's important address summarised in *NATURE* of November 8 and 15, 1917. Prof. Morgan contends for the stability of the gene; if it vary, the variation falls around a mode. This question is further elucidated by Dr. R. Goldschmidt, who describes "Genetic Experiments concerning Evolution" (*Amer. Nat.*, vol. lii., No. 613), carried out on the gipsy moth (*Porithetria dispar*) and other species; from the crossing of races the caterpillars of which show varying amounts of dark pigment Dr. Goldschmidt concludes that the multiple allelomorphs for pigmentation "are different quantities of the substance which we call a gene, which act according to the mass-law of chemical reactions, i.e. produce a reaction or accelerate it to a velocity in proportion to their quantity." Insects from various European and Asiatic localities have been used in these experiments, and the author states that "the first step in the differentiation of species which occurs in Nature seems to be the formation of geographic races."

With this paper may be compared the second instalment of J. W. H. Harrison's "Studies in the Hybrid *Bistoninae*" (*Journal of Genetics*, vol. vi., No. 4), in which details of the results of crossing several species