

from the Upper Coal Measures of Newcastle (N.S.W.). Much light on the phylogeny of the Insecta may be expected from such studies in Australian palæontology, and the author gives us (*t.c.*, part 1) an example of this in the type of a new order, the Protomecoptera—"a very remarkable fossil from the Ipswich [Queensland] beds . . . the direct connecting-link between the Palæozoic Palæodictyoptera on one hand, and the recent Mecoptera on the other."

In describing these primitive metabolous insects, and comparing them with Neuroptera, Trichoptera, and Lepidoptera, Mr. Tillyard lays stress on the presence in the Mecoptera and Planipennia of a frenulum or group of wing-coupling bristles, comparable with the well-known organ on the hind-wing of most moths, and argues thence in support of Dr. Handlirsch's contention for a close relationship between all these orders. In a very short but important note (*Entom. News*, vol. xxix., p. 99) Mr. Tillyard points out that a frenulum of simple type is present in those minute primitive moths the Micropterygidae, which have usually been regarded as devoid of that organ. In thus enforcing evidence for the relationship of archaic members of various orders of insects, the author well justifies his use of the morphological method in entomology.

G. H. C.

THE PROMOTION OF TEXTILE INDUSTRIES.¹

THE Departmental Committee appointed by the Board of Trade to consider the position of the textile trades after the war has presented a most interesting report, which is unanimous except for small details concerning certain tariffs.

The report sets out very clearly the dominant position of the Allied countries in respect of the raw materials of the more important textile trades, and lays special emphasis on the exceptional and powerful position which the British Empire holds with regard to the production in particular of wool, jute, and the finest qualities of cotton. The Committee is particularly insistent that this position must be safeguarded by continuous and systematic scientific research on the raw materials to improve production both in quality and yield. A striking illustration is quoted to show how scientific sheep-breeding in Australia has improved the quality of wool clipped per head; whilst special emphasis is laid on the urgent necessity for the systematic and scientific study of the growing of cotton. The fringe of this latter subject has only just been touched, and there are immense possibilities in the production of cotton modified by the grower to suit the user.

The Committee, moreover, advocates scientific research on the fundamental principles underlying the various manufacturing processes of the several textile industries, and it is significant that this Committee, composed mainly of prominent manufacturers, emphasises so strongly its belief that such research will stimulate the development and prosperity of the industries represented on it. Three important lines of inquiry are suggested:—

- (1) Scientific research in connection with raw materials.
- (2) Scientific research in connection with the improvement of processes such as carbonising, carding, spinning, weaving, dyeing, bleaching, printing, and finishing.
- (3) Technical investigation with regard to the improvement of machinery.

¹ Report of the Departmental Committee appointed by the Board of Trade to consider the Position of the Textile Trades after the War. 1918. (Cd. 9070.) Price 1s. 3d. net.

The machinery and methods of the present day are adapted to suit the various types of textile fibres commonly produced, but it is considered that scientific research in connection with the raw materials will evolve and select special types suited to the products required, and that then the cultivation of these types might be encouraged. In manufactures the discovery of the mercerising process of cotton and the production of artificial silk are quoted as instances to show that great improvements can be effected in existing processes and in the discovery of entirely new ones.

The Committee feels unable to recommend the compulsory adoption of the metric system at the present time so far as the textile trades are concerned. The great British textile trades, more particularly the cotton trade, are so predominant in the world that similar industries in other countries have had, in the main, to follow their lead and accept their technical standards, whilst all the textile machinery used in this country and supplied by British manufacturers to foreign manufacturers is based upon British measures. The yard is the standard of measurement for textile goods in almost all the great markets of the East, of the United States of America, and throughout the British Empire, and the larger proportion of our textile export trade is done with non-metric countries. In fact, it is considered that the adoption of the metric system can be brought about in this country, so far as the textile trades are concerned, only with the full concurrence and co-operation of the whole British Empire and the United States of America.

The report criticises the British system of technical and art education, which, in the opinion of the Committee, has failed to supply the textile industries with a sufficient number of highly trained workers and managers. It is suggested indirectly that the Education Act of 1902 is partly responsible for this, in that the management of the majority of technical schools was then vested in municipal bodies, which are elected for quite different purposes, and rarely prove attractive to local manufacturers—a drawback not corrected by the co-option from outside the local education authorities of manufacturers on school management sub-committees. It is noteworthy that this Committee, composed mainly of large employers, considers that it is urgently necessary to awaken the employers of the textile industry to the value of adequate education, particularly of their higher staffs.

R. H. P.

IRISH SEA PLANKTON.¹

THE importance of studying the common plankton organisms is shown by Prof. Herdman in his "Spolia Runiana," where, basing his results on more than ten years' systematic collecting and working out of standard plankton hauls in the Irish Sea, he points out how the results depend mainly on the presence of only a few genera and species which appear at certain seasons with great regularity and constitute the bulk of the food supply available in the sea. He therefore makes a careful analysis of the quantitative distribution of the six commonest copepods as representative of the zooplankton, each belonging to a separate genus, and the seven commonest diatom genera as representative of the phytoplankton, and the results show that the seasonal distribution of these forms is remarkably constant. Thus the diatoms have two maxima in the year, the larger in spring, the lesser in autumn, the copepods always increasing after and not with the diatoms, so that their maximum is in the summer. The diatoms are thus the forerunners of the small

¹ "Spolia Runiana." III. "Distribution of Certain Diatoms and Copepoda throughout the Year." By Prof. W. A. Herdman. Journ. Linn. Soc., Botany, vol. xlv., p. 173, 1916, and Zoology, vol. xxxiv., p. 95, 1918.