

Textile Research.

THE report of the proceedings of the Imperial Wool Research Conference, 1930, recently published, contains the recommendations of the Conference, with observations on them made by the Imperial Conference, and the papers and addresses given at the Conference, some of which have already been noted in NATURE. A further paper by Mr. A. Frobisher, secretary of the Wool Industries Research Association, entitled "Textile Research on the Continent", which, owing to the pressure of time, was not read at the Conference, is included as an appendix. This paper gives a brief account of the Deutsches Forschungsinstitut für Textilindustrie at Dresden, about one-third of the activities of which is devoted to wool problems. At these well-equipped laboratories much fundamental research is carried out under the direction of Dr. Kraus, as well as the investigation of purely technological problems, such as the strength and elasticity of yarns, resistance of fabrics to friction, fracture, and folding or creasing. At the Institut für Faserstoffchemie, Berlin-Dahlem, under the direction of Prof. R. Oliver Herzog, pure research on textile fibres is being carried out, the equipment for investigation of the ultimate structure of fibres by X-ray methods being very complete. Excellent facilities are provided for research workers, including visitors from other countries.

Numerous papers on fundamental research on wool improvement have also been published by the Institut für Tierzucht und Vererbungsforschung der Tierärztlichen Hochschule, Hanover, although an important function of this institution is the training of students.

Hitherto there has been no institution in Italy engaged entirely on the solution of problems connected with the woollen and worsted industries, although some wool research is carried out at the textile schools. An institute intended mainly for wool investigations is now being built in Biella and this will be financed entirely by the industry. Wool research in Switzerland is carried out at the Experimental Station, St. Gall, where three research workers are engaged on such problems. In France, industrial research work is largely supervised and financed by the National Office for Scientific, Industrial, and Agricultural Research at Bellevue, near Paris, most of the research work being carried out at the Laboratoire des Services Textiles du Conservatoire National des Arts et Métiers, Paris, and at the laboratory at Roubaix.

In Belgium, collaboration between manufacturers and the research laboratories financed by a national fund for scientific research was ensured in 1929 by the formation of a special Bureau of Industrial and Scientific Relations. Under the agreement, manufacturers may submit special research problems connected with their industries to the laboratories, provided the problems are of general interest. In such cases, the direct expenses of the research are defrayed by the manufacturer.

Textile research has been carried on at the Masaryk Labour Institute in Prague since February 1926, and in 1929 an independent Czechoslovakian Textile Institute was founded to advise the industry on the elimination of waste and improve productive capacity. A Research Institute for the Textile Industry has also existed in Reichenberg for the past eight years and a new building is now being erected. This Institute covers all branches of the textile industry and it has recently constructed a special apparatus, the 'rapid lanometer', for measuring the fineness of wool.

A certain amount of wool research is carried out at Delft by the Dutch Government Information Service for the Textile Industry, and also at the textile schools at Enschede and Tilburg. The Ministry of Agriculture of Hungary has recently established a wool research institute; while a considerable amount of research on wool production is being carried out at the Experimental Station for Animal Husbandry, Boguchwala, ad Rzeszov, Poland, under Dr. Marchlewski. Wool research is also being developed at the Jagellonian University at Cracow, and research on sheep-breeding at the Zootechnical Department of the University of Bukarest.

Wool is included in the ambitious scheme of research for the five-year period drawn up by the Central Research Institute for the Textile Industries (Niti), of the U.S.S.R. The wool section had ten research workers during the first year, a number which is expected to reach fifty-six. The Five Years' Plan includes research on all that is fundamental in providing data for a complete reorganisation of the wool industry on scientific lines.

Textile research is being carried on in Great Britain, notably in the Clothworkers' Departments, University of Leeds. A research scheme was established in 1928 with the aid of a special grant from the Worshipful Company of Clothworkers, and the report for the session 1929-30 contains references to work on the elasticity of wool, the elastic properties of wool in organic liquids, the micelle structure of the wool fibre, and the action of caustic soda and sodium sulphide, which has already been published in NATURE or other scientific journals.

The earlier discovery, resulting from the study of the adsorption of water by wool, that the wool fibre is constructed from long-chain protein molecules arranged lengthways along the fibre, has formed the basis of the work of the past session. In addition, the discovery of a method for measuring the scaliness of different wools and hairs marks the first step towards establishing the milling process on a scientific foundation, the surface scale structure of the fibre being responsible for the felting and shrinking of wool fabrics in the milling process. Other technical investigations have related to the thermal conductivity of textile materials and fabrics, the transmission of water vapour through textile materials and fabrics, and the comparison of wool oils and creams.

Progress in the field of textile physics as a result of X-ray methods has already been noted in NATURE for April 11. The crystallographic picture of the molecular architecture of the wool fibre, although incomplete, has already thrown new light on many typical properties which are of great importance in manufacturing processes. Correct interpretations of conditioning, dyeing, and other adsorptive processes have been facilitated and our ideas of all operations involving the elasticity of the fibre have been clarified. The well-known 'permanent set' of wool fibres is a direct consequence of the action of steam on the stretched β -form of wool (and hair) but not on the unstretched α -form. Results of the X-ray investigation of the wool fibre are related to similar investigations on the structure of natural silk, which finds its counterpart in stretched wool and not in normal wool. Accordingly, silk does not show the long-range elastic properties of wool because it is already in the extended state. The X-ray investigations have also been related to the structure of cellulose, and the structure based on ideas current in Germany is considered unsound. The point is of technical interest in relation to mercerisation.