THE CHANGING ROLE OF THE TEXTILE ENGINEER

IN his inaugural lecture as research professor of textile engineering in the University of Leeds, now published by the Leeds University Press*, Prof. P. Grosberg pointed out that the textile engineer still plays a very large part in the day-to-day work of the designer of textile machinery. However, partly owing to the general shortage of trained engineers, engineering designers of good quality are scarce in this branch of industry, and until very recently most basic changes and design concepts with regard to textile machinery resulted from the creative ideas of the textile manufacturers. Fundamentally, the lack of precision in our knowledge of textile processing derived from the difference in kind between the manipulations performed by textile machinery and those performed by all other manipulative machinery. The basic purpose of textile processing was to take fibres arranged in one pattern and rearrange them in a second pattern. As this was done indirectly, textile processes tended to be of a statistical nature and there might be 40–100 manipulative processes of one kind or another in the chain between clean wool and cloth. Moreover, since the magnitude of changes produced by processing was never measured nor was there any clear idea of how these changes were produced, it was not surprising that no major change in the design of textile machinery occurred from the time such designs reached a developed mechanical form in the nineteenth century until 1946.

The present change in the role of the textile engineer started after the Second World War with the changes in the position of textile machinery manufacturers which resulted from the increased international form of the market, the consequent necessity to improve the machines and to consider them as part of the chain of operations the efficiency of which must be maximized, and thirdly, with the change in the structure of the industry resulting from the production of man-made fibres. This was especially so in the last-mentioned case in their use in blends with natural fibres, and the consequent need for theoretical and technological understanding of the problems involved. The trend to large vertical organizations with their economic advantages also stimulated the search for an exact knowledge of the factors involved in textile processing. The research chair of wool textile engineering at Leeds was founded in 1947, mainly to act as a nucleus around which changing points of view on the purpose and aims of textile manipulations could be crystallized; however, the more conventional engineering problems of textile machinery have not been neglected. Without doubt, the main interest in textile engineering research lies in the understanding of the geometrical changes that occur in processing and their effect on the properties of the resulting textile material. The object of textile processing, according to Prof. Grosberg, could be considered to be a method of arranging fibres so that both the maximum strength and the ease of blending of the arrangement should be the sum of the strengths and blending resistances of the constituent fibres. This was very nearly achieved by traditional textile processing, but it was only in the past decade that the careful examination of the fibres in a twisted yarn had led to a more realistic model in which the helices become spirals of varying radius.

The knowledge that a limit of regularity exists had been an important advance, but investigations into why some yarns are much more irregular than this limiting or ideal yarn had run into many difficulties. All these investigations too had demonstrated the necessity for the fibres to be reasonably parallel and disentangled for roller drafting to operate successfully. An early need of the textile engineer who wished to modify existing processes was to disentangle the true from the supposed purpose of many textile machines. The manufacture of yarn was only part of the processing sequence and there was a lack of knowledge of the effect of geometrical changes in the cloth in its mechanical proportions. However, investigations have already made it clear that some of the finishing processes are indirect methods of obtaining geometrical changes within the material which cannot be detected merely by measuring the area changes occurring in the cloth. The vital changes of the past decade in spinning and knitting have shown the very close connexion existing between a proper knowledge of the end-product and a correct design of the machine to produce it. It was to be hoped that the finishing trade might soon benefit from a more rational approach and so place the design of plant for this section of the industry on a more rational basis. Finally, as a result of this new necessity for the textile engineer to understand the requirements of the process for which he designed and made machinery, Prof. Grosberg pointed out, a new emphasis in his training was needed, and that training in future should provide a fundamental knowledge of fibre science, cloth and yarn properties, and what could only be called 'textile engineering' itself.

* *The Changing Role of the Textile Engineer*. By Prof. P. Grosberg. (An Inaugural Lecture delivered in the University of Leeds on 14 January, 1963.) Pp. 14. (Leeds: The University Press, 1963.) 2*s*. 6*d*.

GALATHEA DEEP-SEA ISOPODS

THE *Galathea Reports*, in which the scientific results of the 1950–52 Danish Deep-Sea Expedition are published, need no introduction to marine biologists. In 1956, Torben Wolff, deputy leader of the expedition, described the isopod crustaceans obtained from depths exceeding 6,000 m from the Banda, Kermadec and Philippine Trenches. Of the twelve hadal (ultra-abyssal) species, eight were new and seven of them belonged to known genera of the Asellota.

The same author has now prepared an account of the systematics and biology of the bathyal and abyssal species of Asellota from depths between 200 and 6.000 m*. The total of 83 specimens is not impressive when compared with those of some other deep-sea expeditions, but they are referable to 23 species of which all but two are new and three belong to new genera. In addition, thousands of specimens collected by the *Challenger*, *Albatross*, *Thor*, *Ingolf* and other expeditions have been re-examined and some families, genera and species have been revised. Keys to the determination of all the genera of all families, and of the species of those genera that are treated in detail, have been prepared. As a result of this revision, the author has described seven additional new species, established three new genera for previously known species, and 'invalidated' a number of recently established families

* *Galathea Report*, Vol. 6: *The Systematics and Biology of Bathyal and Abyssal Isopoda Asellota*. (Scientific Results of the Danish Deep-Sea Expedition Round the World 1950–52.) By Dr. Torben Wolff. Pp. 320 + 19 plates. (Copenhagen: Danish Science Press, Ltd., 1962.) 120 Danish kr.