

and elsewhere. It was still insufficiently realized that social fact-finding, by means of intensive and extensive field and documentary research, was both essential and very expensive. Finally, besides urging that every major educational undertaking should be so far as possible based on the results of research, Mr. Boyden suggested several questions in which research could provide a guide to policy; he also stressed the need for stable careers in educational research, and thought that a Council for Educational Research was desirable.

Mr. P. Goodhart thought that besides research into the problems of learning there was even greater need for research into the technological problems of British outlook. Mr. S. Irving suggested that one reason for the neglect of educational research was the tendency to regard education as an art and not a science. Supporting the idea of a separate Council for Educational Research, he thought more co-ordination was needed, but that the main effort in research should not come under the establishment responsible for the administration of our educational system. He thought Britain could profitably spend £25,000 a year on such research, and in this view he was supported by Mr. A. Albu, who, however, thought that educational research should be part of a wider field—that of a social science or human sciences research council, rather than a separate educational research council. Mr. F. Willey, supporting the idea of an educational research council, thought that such a council should be responsible to the Lord President of the Council, and thought there should also be a close relationship with the Ministry of Education.

In replying to the debate, which he welcomed, Sir David Eccles agreed that the tendency to regard education as an art instead of a science might be one

reason for the neglect of educational research, although more such research was proceeding than was generally known. Referring to the administrative changes which were in progress to expand research and intelligence in the Ministry, drawing largely on the Inspectorate for the staff of the new Curriculum Study Group, Sir David said besides this Group there was a new Research and Intelligence Branch and a much stronger Statistics Branch. For the moment, the main task of the Curriculum Study Group would be to identify gaps in our knowledge which might be filled by research, and the Research and Intelligence Branch would then see which of these gaps could be filled and by whom. Two kinds of project were visualized. The first of these would be organized from outside the Ministry, and here Sir David hoped to gain the assistance of a committee of experienced advisers, while the second would be organized within the Department to assist the Minister in policy decisions. At present the Curriculum Study Group was engaged on a study of examinations below the level of the General Certificate of Education arising out of the Beloe Report.

A new consortium of manufacturers and local authorities under the aegis of the London County Council, called the Science Equipment Consortium, was doing for science equipment what had been done for some building materials by the Architects and Buildings Branch. Besides the field of science teaching being taken up in the Nuffield Foundation project (see *Nature*, 194, 238; 1962) there was the whole field of visual aids. In conclusion, Sir David agreed as to the importance of stable careers for research workers, expressing also the opinion that some interchange between teaching, administration and research would be useful.

## THE WOOL INDUSTRIES RESEARCH ASSOCIATION

THE report of the director of research\*, Dr. A. B. D. Cassie, for 1961, presented at the forty-third annual general meeting of the Wool Industries Research Association on April 11, refers to continued investigations into the causes of seasonal variation in wool production, including an intensive study of the causes of winter thinning or break in the staple, and of the incidence of shedding of fibres. Much work has been done on the identification and quantitative determination of different kinds of fibres in blends and an automatic amino-acid analyser based on the estimation of amino-acids as their copper complexes has been constructed. Extensive studies on the fractionation of  $\alpha$ -keratose and  $\gamma$ -keratose have shown them to be heterogeneous mixtures of similar peptides which are very susceptible to hydrolysis in alkaline media, and  $\alpha$ -keratose and  $\gamma$ -keratose are now believed to be sub-units of a protein structure of very high molecular weight. The —SS— and —SH contents of wool have been determined by polarographic methods which measure the uptake of various mercurials by virgin and reduced wool. Evidence has been obtained that the differences in the reactivity of the cystine fractions from wool keratin cannot be attributed to differences in accessibility of the cystine, to whether cystine forms intra- or inter-chain linkages, or to whether cystine is located in the fibrillar structure of the fibre

or the matrix surrounding the fibrils. Difficulties in measuring accurately diffusion of dyes in keratin have been largely overcome by using thin uniform sections of horn keratin cut by microtome to a thickness of about  $7\mu$ .

Dr. Cassie also refers to further developments with the tension regulator developed for fitting to the Noble comb for controlling feed; to a continuing examination of the fundamental causes of fly waste; to further work on the effect of acid dyeing on the properties of carpet yarns and carpets. A survey of woollen and finishing operations following the tinter was commenced and attention directed to scouring in package form of worsted yarn containing a castor/sperm type combing oil.

In his chairman's address at the annual general meeting, Mr. F. W. Hirst referred to the growth of co-operation and instanced the satisfactory shrink-resistance of knitted garments to-day resulting from the joint efforts of the Hosiery Research Association and the use of a Woollen Industries Research Association shrink-resist process. A Committee of Chairman and Directors of the Textile Research Association had considered ways of promoting closer working of Associations. Healthy co-operation between the industry and the International Wool Secretariat was noticeable, while another example of co-operation was to be seen in the resolution of problems of industrial relations by discussion between management and the Unions.

\* Wool Industries Research Association. Publication No. 218; Report of the Director of Research for 1961. Pp. 41. (Leeds: Wool Industries Research Association, 1962.)