LEATHER AND SHOE RESEARCH ASSOCIATION.

The work of the Leather and Shoe Research Association during the year has demonstrated in a practical manner the important advantages to be gained by the participating industries in arriving at a clearer understanding of each other's requirements through a fuller knowledge of the qualities of leather, on the one hand, and the principles underlying the manufacture of leather goods, on the other.

As a result of research on leather carried out during the year a number of factors affecting the waterproofness of sole leather, the tensile strength, stretch, and " crackiness " of chrome upper leather, and the fineness of " break " of upper leather have been determined.

Shoe research has been directed towards a general survey and examination of some of the materials used in shoe-manufacture and the general principles underlying some of the processes. The fact that one hundred and ten factory problems, distributed among the majority of the firms, were submitted for investigation during the year indicates that members of the Research Association are fully appreciative of the technical service provided.

As before, close contact has been maintained with the industries concerned by periodical visits to tanneries and shoe-factories, and the results of the research work, together with general technical information, has been circulated in the form of monthly letters.

WOOL MANUFACTURERS' RESEARCH ASSOCIATION.

The Textile Research Officer took up his duties in New Zealand in October, 1938, after having spent nearly four months in Europe investigating different sections of the wool-textile industry and recent improvements in textile machinery. The valuable information he obtained concerning overseas developments in the wool-manufacturing industry has been passed on to members of the Research Association in New Zealand through the medium of monthly letters. Immediately after his return to New Zealand the Textile Research Officer visited the mills of all members of the Association and has investigated a number of special problems.

In the chemical laboratory the study of the raw-wool-scouring process has been continued and reports sent to the mills. An important investigation on woollen-batching oils has also been completed and a report circulated. Numerous service problems submitted by the mills have been dealt with.

Investigations on the problem of damage to wool by micro-organisms have been continued at the bacteriological department of the Otago University, and some interesting results have been obtained from experiments on the action of trypsin on wool fibres. For example, it has been found that elongation of the fibre greatly increases the susceptibility to enzyme attack.

A number of monthly letters on various aspects of the research work of the wool industry generally have been circulated during the year.

RADIO RESEARCH.

After an initial period of difficulties associated with the securing of suitable qualified research workers and the special equipment necessary had been successfully overcome, the research work under the direction of the Radio Research Committee has made very satisfactory progress.

In March, 1939, Dr. L. V. Berkner, of the Department of Terrestrial Magnetism, Carnegie Institution of Washington, visited New Zealand. Dr. Berkner, who is a research worker of high standing, particularly in the field of ionospheric research, spent some time in discussions with local research workers on radio research problems, and his visit proved of very great benefit.

As stated in my previous report, the radio research work is being directed chiefly along three lines—namely, (1) ionospheric investigations; (2) research on the reception of distant signals; (3) research on the propagation of radio waves.

Ionospheric observations are now being made regularly at Christchurch and at less frequent intervals at Wellington. Automatic recording-equipment for this purpose has been installed at Canterbury University College. The information obtained from these observations is being exchanged with observatories in other parts of the world in order to obtain a world picture of the changes that are taking place. Research on the reception of distant signals is being carried out at Auckland University, and this work will be considerably accelerated by the recent appointment of Dr. K. Kreielsheimer, who is specially qualified in this branch of the work. Arrangements were made for Dr. Kreielsheimer to remain in Australia for some weeks before proceeding to New Zealand, in order to study recent developments of the work being carried out by the Australian Radio Research Board.

Very interesting results were obtained from a survey of the field strength of local broadcasting-stations carried out by Mr. G. Searle, who was seconded for the purpose by the Post and Telegraph Department. A detailed study of the disturbance produced by various types of obstruction was made, and the results were published in the *New Zealand Journal of Science and Technology* and reissued as Radio Research Publication No. 1.