

It is further intended that these investigations shall be closely linked with the cold-storage researches at present being conducted at the Cawthron Institute, and also, it is hoped, in association with overseas organizations.

A grant made to the New Zealand Institute of Horticulture has enabled the citrus survey to be continued on the rootstocks imported, and worked over with the buds of selected varieties which are likely to prove successful under New Zealand conditions. These new stocks have now reached the stage when they can be removed from the nursery and planted out in tried areas at selected points in the Auckland Province.

## LEATHER RESEARCH ASSOCIATION.

### ANNUAL REPORT.

Advisory Committee: Messrs. J. E. Astley, A. E. Lawry, D. Phillips, W. Donovan. Research Chemist: Mr. P. White.

The work carried out during the year was arranged so as to continue the policy of the association as adopted in previous years. The practical application of the results of research work and the investigation of factory problems were regarded as being the most important aspect of the association's activities.

The present economic conditions demand that the efficiency of all the processes in the factory shall be as high as possible, without the wearing-values of the leather being deleteriously affected. Consequently, most of the factory problems investigated have been along these lines. The problem of economizing in materials, time, and labour has been considered from the chemical standpoint. It is being more and more realized that the physical properties of leather are equally important as the chemical properties. Chemical analysis has its value from the economic point of view, but other methods of examination also are necessary. The microscope is a valuable aid to partially follow the actual conditions of the fibres during the course of tanning. Microscopical examinations of leather in process of manufacture, and the finished article, have been made in conjunction with chemical analyses, with a view to correlating as far as possible the chemical with the physical aspects.

As in all scientific investigations, there must be close co-operation between the factory and the laboratory. As in previous years, visits have been made to the tanneries. These have been in a consultative capacity, and those firms which have received most benefit are those which have taken advantage of the facilities available.

Every effort has been made to keep in touch with the foremen and operatives, so as to imbue the spirit of inquiry amongst as many as possible.

What is considered as routine work—that is, the examination of raw materials from the monetary aspect—has been slightly developed during the year. It is essential to know the actual values of the materials purchased; but it is even more necessary to know something about their properties. Many of the substances used are proprietary articles and at various times have to be modified to suit changing conditions. This cannot be done by rule-of-thumb methods until something is known about their constitution.

In conjunction with the British Leather Research Association, investigations of the best conditions for curing hides have been continued. So far it has been established that the presence of a small quantity of sodium fluoride in the curing salt has a beneficial effect in preventing the growth of the red halophilic bacteria. On freshly cured hides the leather does not appear to be deleteriously affected by this chemical. The result on hides stored for some months, when cured by this method, is being determined before any definite conclusions are reached.

An investigation into the cause of greasy hides has shown that this defect is due to improper methods of flaying and curing. Having determined the cause, investigations are now proceeding to, if possible, find out a remedy, other than that of altering the conditions of curing.

The work on the wearing-values of sole-leather has proceeded, using both practical and laboratory tests. The association is indebted to the Government institutions which have carried out the practical tests. Some of the conditions affecting the wearing-values have been determined, and, as far as possible, factory methods have been altered to produce leather which will give longer wear when worn on the shoe-soles. Microscopical and chemical analyses have been made in conjunction with these tests, and to a certain extent the results have been correlated. The theoretical aspects of wear have been considered, and, arising out of this, experimental leathers have been made. These are now being tested to determine the improvement, if any, that has been made on wearing-value.

Contact has been maintained with the boot-factories, so as to obtain direct information as to the quality of leather being produced in so far as it affects the boot-manufacturer. The information thus obtained has been valuable to the tanner, not only in presenting a means of remedying faults, but in the production of leather suitable for different conditions of work. The boot-manufacturers are relying on the New Zealand tanners to supply the whole of their requirements of leather, with the exception of kid, fancy, and patent types. This entails modifications in the manufacture of the leather to produce goods which previously have been imported. In addition to helping the tanner, the visits to the boot-factories have been helpful to the boot-manufacturer. Problems in connection with leather have been discussed, and as a result minor operations which had a detrimental effect have been altered or omitted.

During the year work has been continued on pelt problems. In conjunction with the British Leather Research Association, trial shipments of pelts were sent to England. The reports on these have materially increased the amount of knowledge available on pelt-processing.