

An investigation of some of the factors affecting the hardness imparted to leather by tannage has been carried out. The main lines of the investigation included an examination of the following factors :—

- (a) The effect of liming and deliming on the hardness of sole-leather.
- (b) The effect of buffers on the swelling and plumping of the hide in the early stages of tanning.
- (c) The buffer capacities of water solubles and leather fibres in relation to the reaction of the leather when placed in acid solutions.
- (d) The conditions necessary for the hot pitting process to produce firm leather.

FACTORY SOLE-LEATHER.

Sole-leather, from the tanners' point of view, should be resistant to water-absorption and have a high wear resistance. The shoe-manufacturer requires in addition that the leather shall be easily worked under modern methods of mass production. To some extent these two aspects are in conflict. An investigation of the shoe-manufacturers' requirements has been carried out and a tanning process suggested which will produce a leather which is considered to be a good compromise between the two points of view.

BRITISH LEATHER MANUFACTURERS' RESEARCH ASSOCIATION.

During the year a closer co-operation with British Leather Research Association was established by submitting to them the results of the work carried out. This has been greatly appreciated, and some of the monthly circular letters have been recirculated in the monthly letters of the British Association.

DEFENCE DEPARTMENT.

As in previous years the Director was consulted by the Defence Department on the care, condition, and treatment of the leather equipment at Trentham.

GENERAL.

During the year the activities of the Research Association in applying the results of research to the solution of factory problems have been fully maintained. The examination and testing of raw materials, the processes used, and the finished material have been carried out and critically examined in the light of the latest available information on the subject.

PUBLICATIONS.

The following paper was published : " The Effect of Water Solubles on the Wearing Qualities of Leather." *N.Z. Jour. of Sci. & Tech.* (1937), 19, 4, 245 (also printed in *J.I.S.L.T.C.* (1937), 21, 429.

SHOE RESEARCH.

Advisory Committee : Mr. H. Duckworth (Chairman), Mr. E. Bridgens, Mr. W. Denby.

The Shoe Research section has been organized on lines similar to those which have proved so successful in connection with Leather Research. The ultimate aim is to improve the quality of the finished product and to increase the efficiency of manufacture by the application of the results of research to the industry. The means taken to achieve this end will be—

- (1) Service—i.e., investigations of factory problems.
- (2) Research into fundamental problems.
- (3) Circular letters of an educational nature.

The investigation of factory problems will take precedence over research work. This emphasizes the importance of service. It will be the application of the results of research to the solution of factory problems, which will to a large extent measure the success of the Association.

The first problem submitted by the Committee for investigation was that of tempering sole-leather. Each factory had its own methods based more or less on the type of leather to which it had become accustomed to use. If the tempering process could be placed on a sound footing, based on the properties of leather, the result would be beneficial to both the shoe-manufacturer and the tanner. The different methods of tempering have been considered in relation to the subsequent processes through which the leather passes. As a result of the work, suggestions of a general nature have been made which when applied to the different factories have resulted in—

- (a) A reduction of water-stains on the finished sole.
- (b) Better opening and closing of the channels.
- (c) More uniform levelling.
- (d) Reduction in time of drying.
- (e) Easier scouring.
- (f) Better finishing.
- (g) Better organization of the work.
- (h) A fuller knowledge of the basic principles of wetting sole-leather.

CIRCULAR LETTERS.

A monthly circular letter service has been instituted. These letters deal with the results obtained in the laboratory from work on research and factory problems, and are also of an educational nature. Attention has been drawn particularly to the qualities of leather in relation to definite processes in shoe-manufacture. From reports received, the letters have been greatly appreciated.