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The Society of Dyers and Colourists of Australia

(Affiliated with the Society of Dyers and Colourists, England.)

Victorian Section Notes

A regular monthly meeting of the Victorian Section of the Society was held on Wednesday, May 2, in the Kelvin Hall, Melbourne.

Mr. Stevens presided over the meeting, and introduced Dr. Lipson, who very ably presented the paper, which is published in this section of the journal.

Great interest was shown in the subject dealt with by Dr. Lipson, and an animated discussion followed.

The Problem of Brands in Wool

By M. Lipson, C.S.I.R.O., Wool Textile Research Laboratory, Geelong.

The occurrence of brand marks in the raw fleece has been, for many years, a constant source of trouble and irritation to those engaged in wool processing. References to the problem can be traced as far back as 1805[1], and its seriousness has grown in parallel with the development of the wool industry itself.

Although commonly referred to as "tar," the stains mainly result from the use by graziers of sheep-branding fluids which are not removed by the normal scouring process. Many of these products have, until recently, been based on drying or semi-drying oils which change on exposure to hard residues completely resistant to scouring. As the original preparation often contains a pigment such as Carbon Black, the resulting stain on the wool appears like tar or pitch and is generally called "tar" stain. Tar, however, is now rarely used to brand sheep.

As the problem concerns both grower and manufacturer, it is perhaps relevant to present some information on how and why brands are applied in the field.

The grower brands his sheep for identification and the practice, formerly compulsory in some states, is now optional throughout Australia except for travelling sheep in Queensland and certain parts of Western Australia. The Australian Wool Board advises growers to refrain from branding, if possible, and some properties have already stopped the practice without great inconvenience. However, most sheep in Australia are still branded, and it is therefore necessary to remove brands by some means or other when the wool is subsequently processed.

The brand is usually applied to the back of the sheep by means of an iron or other implement dipped into the fluid. Small drops can be accidentally splashed onto the fleece during this procedure and these are often undetected when the wool is later sorted for brands. For this reason, graziers are advised by the Wool Board to use some absorbent material, such as sheep-pelt, in the pot containing the fluid and to wet only the marking face of the brand. A new type of branding appliance helps to overcome the danger of splashing; it consists of a pad beneath a reservoir and can cleanly brand several hundred sheep with each filling.

Present Treatment of Brand Stains.

Many graziers endeavour to have the brands removed from the fleece during classing, but it is practically impossible to eliminate the fault in this manner. Inevitably there will remain small specks which are often undetected until well on in manufacture. The same remarks apply to sorting in the mill, where, despite the utmost care, brands will get through and cause trouble in subsequent processing.

During scouring, due to the action of hot soap solutions and the pressure of squeeze rollers, the marks often spread. In this way, the extent of contamination can be increased. Fig. 1 shows brand marks in wool after scouring. Carding further spreads the fault by opening up the staples carrying the marks which are then distributed further in the mass of wool.

Combing removes nearly all the brand from the top and concentrates it in the noil. For this reason, the trouble is almost entirely eliminated from worsted processing. However, in the felt and woollen industries, where noils are a major raw material, the prob-

lem is accentuated because of the high concentration of brands in noils. Fleece wool for the woollen industry also requires careful sorting as there is no process, comparable to worsted combing, which can remove brands.

The small pin-points of brand which escape detection usually pass unnoticed until piece-scouring or

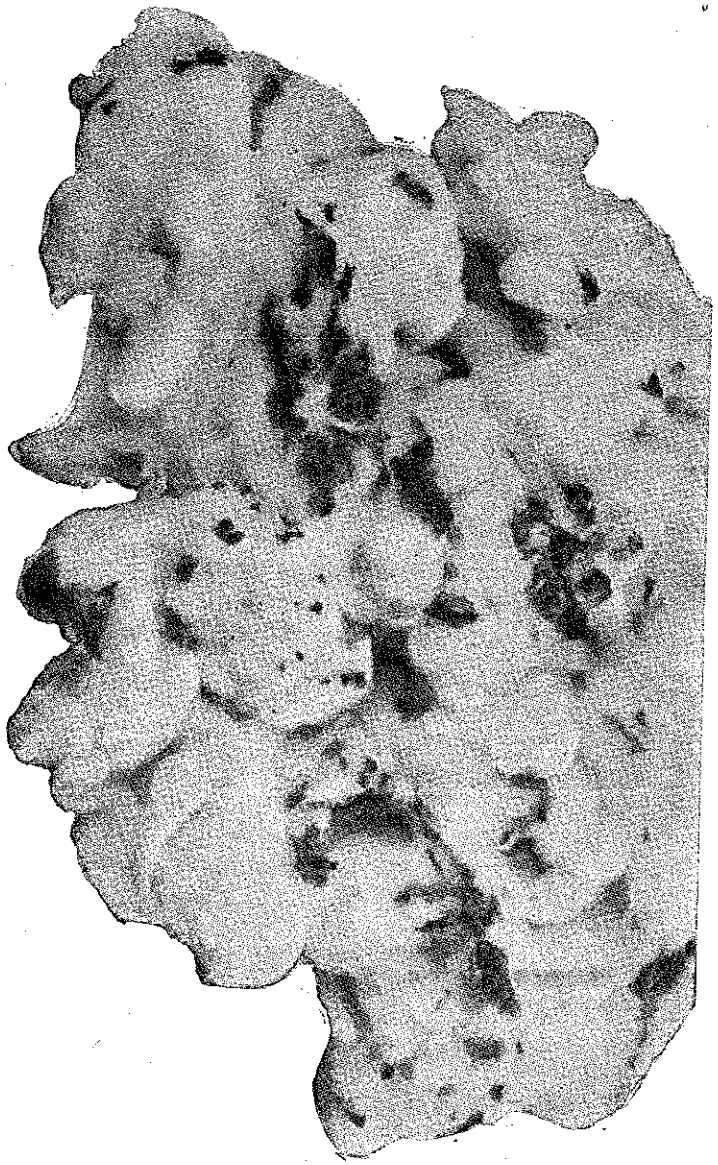

Fig. 1.—Showing Brand Marks Remaining in Wool After Scouring.

milling, when, under the influence of heat and pressure, they spread and seriously stain the cloth.

The problem can be particularly serious in the wool felt hat industry, which uses large quantities of noils as starting material. Fig. 2 shows a wool felt hat form which has been spoilt by brand marks.

The industry suffers considerable inconvenience and expense in removing the contamination. Apart from sorting and clipping brands from the raw wool, special processes are frequently required such as "depainting" or "depitching" of noils, dry cleaning or hand spotting of pieces with solvents, and removal of brand specks from hat forms using forceps.

Estimates obtained from several Australian mills show extra costs, varying from £4,000 to £10,000 per annum to remove brands. These figures are in general agreement with those recently given by von Bergen[2] which show that in 1949 removal of brands cost the Forstmann Woollen Company 48,453 dollars.

Although the damage is of a less direct nature, the woolgrowing industry suffers as a result of the presence of non-scourable brands in the fleece. Firstly, the reputation of wool as a textile raw material is damaged, and manufacturers of certain types of goods will welcome substitutes which can be supplied free from contamination. Secondly, although an exact figure is difficult to obtain, it is known that buyers are prepared to pay more for wool free from brands.

Research on Scourable Branding Fluids.

From the above brief outline, it can be seen that the wool industry as a whole would welcome a sheep-branding fluid which can be removed in the normal scouring process. Although the problem is so serious, the research undertaken in the past to overcome it has not been extensive. This may have been due to the nature of the task, which overlaps both the primary and secondary phases of the industry, and is therefore outside the field of many specialists in either branch.

The Wool Industries Research Association were the first to make a systematic approach to the subject and devised and tested several preparations during the period 1925-1930.[3,4] As a result of this work, the following two fluids were recommended, one for use in Great Britain and the other for the Dominions, where climatic conditions were more rigorous.

Formula 1928/1 for Use in British Isles.

	Parts by Weight.
Wool Fat	150
Carnauba Wax	10
Barytes	70
Colour	17.5
White spirit to consistency.	

The colours used were iron oxide (Red) and ignited chromium oxide (Green).

Formula 1928/8 for Use in Dominions.

	Parts by Weight.
Wool Fat	30
Resin	20
Carnauba Wax	3
Kieselguhr	18
Ignited Iron Oxide	6
"Emco" spirit to consistency.	

These fluids represented a considerable advance with respect to scouring properties on products in use at the time. Although the brands were not completly removed when the wool was scoured, residual traces were eliminated during subsequent piece-scouring. The field performance under certain conditions in New Zealand[5] and Australia[6] was not satisfactory; this is probably a reason why the formula was not generally adopted.

The United States Department of Agriculture started work on the problem in 1942 and, after considerable study in the laboratory, field exposure trials commenced in 1944.[7] A large-scale field exposure test was carried out in 1948 using a preparation based on the following formula:—

Lanolin	100 parts by weight
Carbon tetrachloride ...	25 parts by volume
Pigment	3 parts by weight

The pigments used were carbon black, chromic oxide green, ferric oxide red, ferric oxide yellow, and ultramarine blue. The above product was satisfactorily removed during normal commercial processing of the wool.[2] A disadvantage of the preparation is that it requires heating before application.

Australian Investigations.

Research on the problem commenced in 1943 at the Central Wool Committee Laboratories in Sydney and was later continued by the C.S.I.R.O.

In developing the work, lanolin was chosen as an ideal basic constituent as it satisfies the required conditions of remaining on the fleece for a year and then being removed during subsequent scouring. This. as seen from the experiments outlined above, had been realised by earlier workers. However, a major difference between the present work and that just described, was that aqueous emulsions of lanolin with volatile emulsifying agents were used instead of solutions in organic solvents. It was found that preparations made as aqueous emulsions gave much brighter markings on the sheep than when the same ingredients were applied from solution in an organic solvent, such as solvent naphtha. Another advantage of emulsions is that they are cheaper than solutions in organic solvents. Ammonium stearate was chosen as the emulsifying agent as the ammonia would volatilise on application to the sheep, thus ensuring that the brand could not be emulsified and washed out by rain. It should, however, be removed when acted on by emulsifying agents in the normal soap and soda scouring.

Preliminary experiments consisted in outdoor exposure on pelts as well as laboratory testing on sheepskin samples exposed to a fine spray of water and different temperatures. These tests showed that such lanolin emulsions might form the basis of satisfactory products. Lanolin on its own showed poor weather-resistance which, however, was overcome by including some rosin in the emulsion.

From field trials next carried out, it was soon realised that the colour of the fluid had an important bearing on its field-performance. Pigments such as Monolite Fast Scarlet RNS, Monastral Blue BS, Carbon Black and Iron Oxide, gave good products, whilst Ultramarine Blue became dull very quickly on exposure. Over 150 preparations were made, of which 24 were placed under trial in the field. Some of these were removed satisfactorily during commercial scouring.[8] Large-scale trials were continued on one preparation, the results showing that a product could be made which performed satisfactorily in the field and was removed during normal processing.[9]

In April, 1950, the C.S.I.R.O. released a formula to manufacturers based on the above work. The recommended formula is given below:—

Lanolin (26 lb.), G.-gum rosin (10¼ lb.), stearic acid (7 lb.) and tallow (3¾ lb.) are melted and mixed thoroughly at 230 degrees Fahrenheit. The molten product is then slowly poured into a solution of ammonia S.G. 0.88 (2½ lb.) cold water (17 gals.) preferably with slow mechanical stirring. A preservative such as toluene (3 lb.) or oil of Eucalyptus phellandra (1 lb.) is then added with stirring.

Monolite Scarlet R.N.S. (5 lb.) is mixed with the above in a ball-mill to give a red fluid of exceptional brightness when applied in the field. Monastral Blue B.S. (5 lb.) or Carbon Black (5 lb.) can be used instead of Monolite Scarlet if other colours are required.

This contains less ammonia than originally recommended as viscosity alterations have been found to occur on storage of products of higher ammonia content; certain types of rosin apparently alter and become sticky under these conditions. The trouble does not occur with the lower content of ammonia.

It has been found that the pigments can be used in the form of aqueous pastes as supplied by the manufacturers providing the amount of water in the emulsion is reduced to compensate for the water in the paste. In this way, the use of a ball-mill is eliminated.

Several firms in Australia, New Zealand and Great Britain are now manufacturing the fluid, which should be in fairly wide use during the 1951 shearing season.

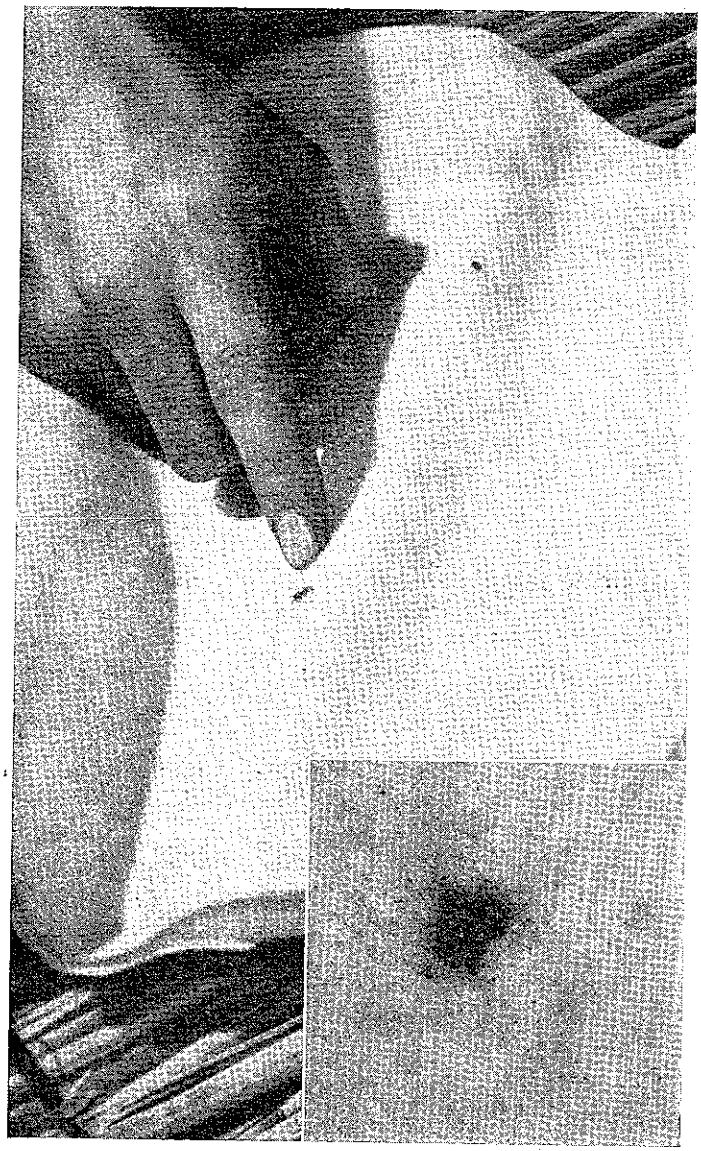

Fig. 2.—A Hat Form Ruined by Brand Marks. Inset is an Enlargement of the Brand Mark.

The new preparation is known as L.B.E. fluid (Lanolin Base Emulsion).

A disadvantage of the preparation is that it is unsuitable for wet sheep and will smear if rain falls immediately after branding. Experiments are in progress at the Wool Textile Research Laboratory, Geelong, to overcome this difficulty. Work is also being undertaken on new pigments, as some of those originally recommended are now in short supply. Before a new fluid can be recommended, it requires a year's large-scale exposure in the field followed by commercial processing of the branded wool. For this reason, progress is often slow, and, if a shearing season is just missed, it may take two years before a new idea can be satisfactorily tested on a large scale.

It can be seen, therefore, that sheep-branding fluids are now available that will not cause trouble when the wool is subsequently processed. The extended use of these preparations, together with their improvement through further research, may eventually eliminate the problem of brands from the wool industry.

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A.G.E. S.A. Manager Retires

Australian General Electric Proprietary Limited announces with regret the retirement, through ill-health, of Mr. C. F. Sharpe, A.G.E. manager for South Australia.

Mr. Sharpe's retirement will be effective as from June 30, 1951.

He originally became associated with The Edison Swan Electric Company Ltd., in 1920, and, after service in Melbourne, became manager for New South Wales, which position he held until 1931. In that year an amalgamation took place of the interests in Australia of Metropolitan-Vickers Australia Pty. Ltd., Ferguson Pailin Ltd., The Edison Swan Electric Co. Ltd., and Australian General Electric Co. Ltd., and Mr. Sharpe was appointed manager for South Australia for the new organisation—subsequently known as Australian General Electric Proprietary Limited.

The position has been retained by Mr. Sharpe up to the present date.