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LANCASHIRE SECTION: Meeting at Bury, 15th January, 1919. Mr. OSCAR S. HALL in the Chair: SIZING

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Mr. ARMITAGE, in acknowledgment, said that national efficiency had to be the aim of all. Capital could and would be attracted when management and labour were both sufficiently efficient to attract capital. To-day, the problem that had got to be solved between management and labour was that of the greatest efficiency of production that could be maintained. The great commercial nations in pre-war times, Great Britain, America, and Germany, each excelled in one of three qualities necessary for efficient production—quality, quantity, and methods of distribution. Great Britain excelled in quality of production, America in quantity of production, and Germany, he believed, in methods of distribution. The problem they had to solve—and it had to be solved between management and labour—was the problem of keeping that quality of handicraft which had been bred in this country, and was still possessed, at all events in textiles, to a greater degree than in any other country, and combining with it some of the qualities of those other two countries. Nobody for long got something for nothing. It was possible that the present movement in labour was to get something for nothing. To the extent to which that was true labour was moving against the laws of nature, and in the long run would be beaten. Labour was entitled to get the best wages that industry could afford to give in return for the best in labour. Both were subject to the laws of efficiency of production. It was up to management to endeavour to create, along with labour, the right atmosphere, so that management would be willing to give the best wages and the best conditions possible, and be entitled to have from labour the absolute best in production and the willing acceptance of all the aids that brains and machinery could give.

The Chairman was also heartily thanked for his services.

LANCASHIRE SECTION.

Meeting at Bury, 15th January, 1919.

Mr. OSCAR S. HALL in the Chair.

SIZING.

By R. H. PICKARD, D.Sc. (Lond.) F.R.S.

THE lecturer repeated a number of observations included in a previous address on the subject (see this Journal, 1918, 9, 18).

The basis of the sizing process, he said, was very little understood, and the manufacturer had not concerned himself greatly about the investigation of it. The relative cost of the size to that of the cloth was very small, but, since the war, had varied considerably for the kind of size employed. One reason for the neglect of investigation of the process was probably because in pre-war days the cost of the size was not a very material factor so long as the sizer achieved the object desired.

He maintained that the great majority of the results required could be obtained with very simple mixtures. Looking at what literature existed on the subject,

one could not fail to be overwhelmed with the extraordinary number of the materials which had been used or recommended for putting into the size beck. One of the difficulties of inquiry into the subject was to ascertain that which had already been published. In this connection, he welcomed the start which had been made in the *Journal of the Textile Institute* to record abstracts of textile literature. In due time a valuable index would be available. In the matter of sizing, the only way at present was personally to consult managers and others. It did not follow, of course, that such people would communicate all they knew. In sizing, many people thought they had valuable secrets, though, as a matter of fact, the real secrets, in any case, must be very few. Most of the substances used were chosen because of the feel imparted to the cloth. The feel not only depended upon the starches used but upon the softener employed. He entered a plea for the systematic study of the softening materials, particularly tallow. Owing to the demands of other industries a number of firms had acquired experience in making fats to a given specification of hardness and melting point. The feel of the cloth was largely dependent on the fats, the approximate neutrality of which appeared to be important. The possible production of fats or waxes of almost any degree of hardness or of melting point had opened a very wide field to the size mixer, because it should thus be possible to produce a cloth of the desired feel by varying the fat used. An added advantage was that these manufactured fats, generally spoken of as "hardened," should be without odour or colour.

Another vexed question had arisen out of the food difficulty, namely, whether the cotton manufacturer required to use wheaten flour at all. All sections of the trade were not agreed on the matter, and few manufacturers of India and China shirtings would admit that wheaten flour was unnecessary. With the exception of the gluten it contained, it was highly probable that all the common commercial starches when boiled with water gave the same substances as were present in the paste made from wheaten flour; whilst, when flour was fermented for any length of time, to all intents and purposes the gluten was wasted.

Feel and appearance, however, were not the only considerations in sizing. Thus, from the commercial point of view, it seemed to him that sizing should be considered not only with regard to the feel and appearance of the cloth produced, but should be studied more in detail from the point of view of the behaviour of the warp under the strain of weaving. Stoppage of the loom occurred most frequently owing to the yarn breaking close up against the fell of the cloth. The elasticity of the yarn often became exhausted at that point, and it would appear that there was greater strain on the yarn at that point than at any other. Therefore, he was inclined to inquire as to what knowledge was available as to the action of the various constituents of the size on the strength of the threads and fibres. The sizer was generally on the look-out for the increase or decrease in the

pliability of the yarn, but did not always realise the difference between pliability, strength, and elasticity. An effective method of measuring elasticity was required as a preliminary to investigation of the action of the various constituents of the size on the elasticity of the individual fibres and yarns. Most sizers could now convey a very good idea as to the effect of the size on pliability, but the effect on elasticity was more important. At present, far too much was left to individual judgment. A successful solution of the problems of sizing needed the co-operation of both practical and scientific men.

DISCUSSION.

The CHAIRMAN made a spirited appeal for support of the Textile Institute, and invited questions to be put to the lecturer.

Asked if he was sure that the gluten of wheat flour was destroyed, the lecturer suggested that where the flour was fermented some, in any case, was destroyed. As to whether the whole of it was destroyed depended on the duration of fermentation.

As to whether there is any limit to the amount of free fatty acid in tallow used, the lecturer pointed out that some very heavy sizers used distilled wool grease—a mixture of hydrocarbons and free fatty acids which were present to the extent of 30 to 50 per cent in the product used. Starchy materials and China clay were used in large quantities in such cases, and this probably prevented iron stains, and explained why practical experience showed there was no limit to the amount of free fatty acids. On the other hand, with a 20, 30, or 40 per cent size, cases frequently occurred where the size, on standing, became lumpy. In cases where this happened, he had nearly always found that the tallow used had what he would call an excessive amount of free fatty acid—something in the neighbourhood of 10 per cent. Generally speaking, free fatty acids should be below 5 per cent as a safe limit.

Replying to further questions, the lecturer said he had suggested copper sulphate could be used with advantage in place of zinc chloride where the latter was only used as an antiseptic. It had been pointed out that copper sulphate was not used because if the cloth was going to be dyed the copper sulphate

would affect the shade. That was a legitimate criticism when dyeing without previous bleaching was to take place.

Questioned as to the efficiency of the new "hardened" fats in place of tallow, the lecturer said that he had had experience of their use in the early part of 1914, but the samples were not produced for a specific purpose. Instead of the ordinary tallow consistency, they were on the hard side, and of a somewhat too crystalline character. He believed that attempts were now being made to produce "hardened" fats with the required characteristics.

The question of magnesium chloride and free acid might be spoken of more particularly in conjunction with the process of singeing. When magnesium chloride was present in cloth undergoing the singeing process, it decomposed, giving free hydrochloric acid which tendered the cloth and, therefore, he was in agreement with those people who controlled the singeing process when they said that magnesium chloride should be kept out of the size mixture at all costs. The further question arose as to whether it was not advantageous to keep out not only magnesium chloride, but all metallic chlorides. He had come across cases where it was said that the size contained no magnesium chloride, yet the cloth had tendered in the singeing, the explanation being that Epsom salts and zinc chloride had been used. In these cases, although magnesium chloride had not been put into the size mixing, the chemical result was the same as if it had been directly put in.

Councillor BEDFORD moved a vote of thanks to the lecturer, and said he now realised what a useful purpose the Textile Institute was serving.

Mr. H. GRANDAGE seconded, and said he agreed that sizing had been conducted, in the past, entirely on rule-of-thumb lines.

The motion was heartily carried, and thanks were also extended to the Education Authority for the use of the meeting room.

The DIRECTOR OF EDUCATION (Mr. R. Wilkinson) responded, and said the presence on that occasion of a large number of practical men was a welcome indication of the change which was taking place, and he hoped the Textile Institute would prosper exceedingly.