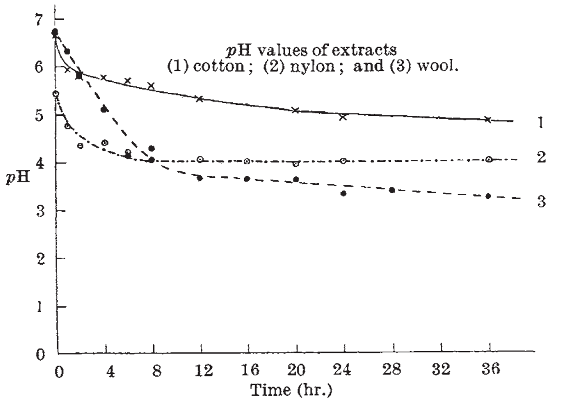

Extracts were prepared from 1 gm. of the material in 100 c.c. of distilled water heated on a water bath for one hour. The results of the preliminary investigations indicate that wool, cotton and nylon after treatment at 150° C. give progressively lower *p*H values and greater electrical conductivity with increasing length of time, as indicated in the accompanying table. The graph shows the effect of duration of heating on *p*H. In the case of nylon, the *p*H value and conductivity remained stationary after 12 hours, but at the conclusion of these experiments, after 72 and 142 hours treatment respectively, wool and cotton were still changing at approximately the same rate as after 24 hours.

The present work, a full account of which will be published at a later date, aims at amplifying the knowledge of the effect of heat on wool, cotton and nylon by a quantitative study of the relationship between heat damage and changes of *p*H value and electrical conductivity at various temperatures under different moisture conditions.

A. O. LLOYD

Research Department,
Porritts and Spencer, Ltd.,
Bamford, nr. Rochdale.
March 29.

[1] Marsh, *J. Text. Inst.*, **26**, T187 (1935).
[2] *Shirley Inst. Bull.*, 225 and 356 (1936); 134 (1937); 324 (1938); 13 (1945).
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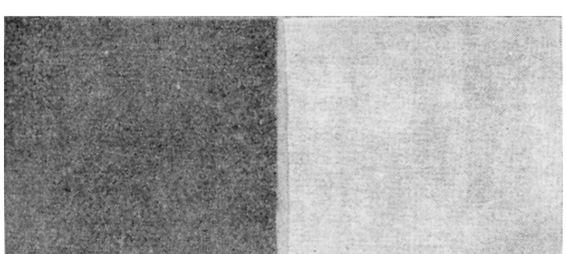
Use of Polymers to Immunize Wool Against Acid Dyes

IT is difficult to reduce the affinity of wool for acid dyes by means of compounds which react simply to form condensation products with the basic side-chains. The latter are relatively inaccessible in the crystalline phase of the fibres, and where a successful 'resist' is obtained, for example, by acetylation in presence of sulphuric acid, it is because incomplete reaction is compensated by the introduction of sulphonic groups into the keratin molecule[1]. The net positive charge acquired by the fibres in acid solution is thereby reduced, thus ensuring that most, if not all, of the dye is acquired by the untreated wool when treated and untreated patterns are dyed in the same dye-bath. In the light of these observations, it seemed likely that a successful 'resist' might be obtained simply by forming an acid polymer within the fibres. The possibility was therefore examined as soon as a convenient method was developed for polymerizing monomers within textile fibres[2].

A 2·5 gm. sample of purified all-wool flannel was immersed in 25 c.c. of a 0·2 per cent solution of ferrous ammonium sulphate for 2 hours at 25° C., squeezed and dried. The pattern was then transferred to 125 c.c. of a solution containing the required amount of methacrylic acid and 0·5 c.c. of 6 per cent hydrogen peroxide, the solution being raised to the boil in 20 min. and boiled for 15 min. After being washed well in running water, the pattern was dyed at the same time as an untreated pattern in a bath containing 2 per cent of Polar Red G and 10 per cent of hydrated sodium sulphate, both percentages being based on the total weight of wool present. Several such experiments were carried out with patterns containing increasing amounts of polymethacrylic acid, a good 'resist' being obtained with 20 per cent of polymer in the wool, as is shown by the accompanying photograph of the dyed patterns. The effect is not due solely to the acidity of the polymer, because a less effective, though positive, 'resist' was obtained with 20 per cent of polymethyl methacrylate, showing that the rate of diffusion of dye into the fibres is reduced by the presence of an internal deposit of polymer.



Untreated   Treated

CLOTH WITH 20 PER CENT POLYMER, DYED WITH POLAR RED G FROM A NEUTRAL BATH

The formation of 20 per cent of polymethacrylic acid within the fibres of a wool fabric has remarkably little effect on its feel, but there is reason to believe that the use of more strongly acid monomers will allow equally satisfactory 'resist' effects to be obtained with much smaller deposits of polymer.

One of us (M. L.) is indebted to the International Wool Publicity and Research Secretariat and the Australian Wool Board for grants which enabled him to take part in the investigation.

M. LIPSON
J. B. SPEAKMAN

Textile Chemistry Laboratory,
University, Leeds.
April 20.

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Luminosity Curve of Trichromats

ACCORDING to Helmholtz's theory of colour vision, luminosity is caused by the summed excitations of the three kinds of receptors. Granit[1], however, suggests that the luminosity is caused by a special type of receptor, the dominators, whereas the other (two) types (the modulators) only give the colour to the observed objects.

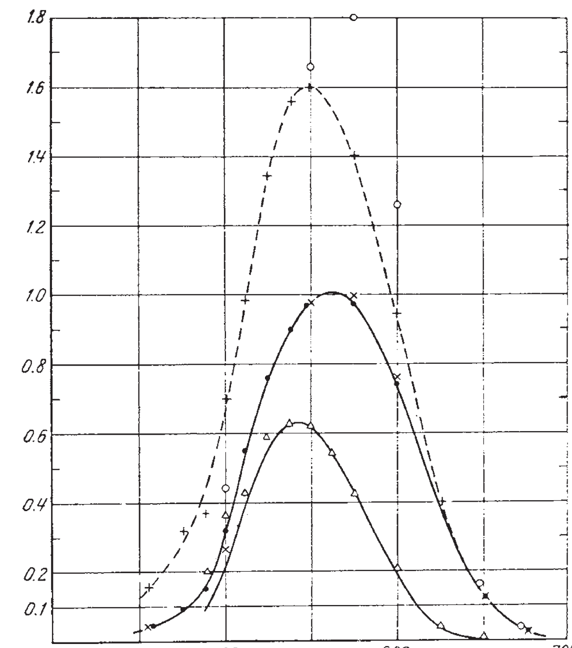
I believe that the measurements reported below can be explained by the first hypothesis only.

(*a*) It is well known that the luminosity curves of different persons show large differences[2], even when we confine ourselves to normal trichromats. Measurements of the sensitivity of twenty-two persons for $\lambda = 0{\cdot}550\,\mu$, expressed in terms of the sensitivity of my own (deuteranomalous) eyes, gave the following results:

104, 112, 115, 115, 121, 125, 128, 130, 130, 134, 140, 142, 142, 150, 166, 166, 166, 192, 193, 200, 208, 217.

Here arbitrarily the sensitivity at $\lambda = 0{\cdot}650\,\mu$ is set equal for all observers. (Generally, the sensitivity curves are drawn so that their maximum is 100.) These results show that the sensitivities may differ by a factor of 2.

In Helmholtz's theory this may be explained by the assumption that the ratios of the numbers of red and green receptors show large variations. On Granit's theory, these differences are difficult to understand. For example, differences in pigmentation cannot explain them, as the subjects showed very small differences in their colour-matches (Rayleigh test).



● Author's luminosity curve.
× Red curve of G.W.N. and author (solid curve).
○ Luminosity curve of G.W.N.
+ Luminosity curve of B. (broken line).
△ Difference between red curve and broken line. Points are on the 'green' curve.