

lead. The present process consists in cleaning the hair thoroughly with a strong alkaline soap, or a little weak alkali, then carefully applying a solution of nitrate of silver, and lastly a solution of monosulphuret of sodium.

- *Wool* differs from hair chiefly by its property of felting, which it owes to its numerous cross lines or serratures, as they are termed; the finer the wool the greater the number of its serratures. Thus, whilst Mr. Goss has found in the finest Saxony wool 2,720 of these serratures, in a single inch in length, he has only found 2,080 in an inch of South Down wool, and 1,850 in Leicester. The wool of sheep can be classed under two heads, that is, into long wool and short wool. Certain classes of sheep will maintain the type or quality of their wool under every circumstance. Such are the original types of South Down, Norfolk, and Dorset, all of which are short wool, and all these sheep feed upon fine and short grass. It has been observed that if they are fed upon coarse grass, their wool will also become coarse. This is also true with Welsh, Scotch, and even Spanish merinos. A further proof that this view appears correct is, that the long-wool sheep, such as those of Leicester, Lincoln and Kent, feed in valleys where grass is long and coarse. In all cases the size of the animal appears also to correspond with their class of food. Another curious fact is the facility with which one type of sheep will merge into another if they change food and climate. Thus many attempts have been made to introduce into France our Leicester breed, the wool of which is so remarkable for its fineness, length, and silvery appearance. Still, after four or five years' residence there, the wool has lost its most valuable qualities. In fact the sheep are no more the Leicester breed. The coarse wool of sheep, however, such as those of Devonshire, does not appear to be so rapidly influenced by any change of climate which the animal may undergo. The aptitude which various kinds of wool have for dyes is also interesting. Thus, the wool of one kind of sheep will not dye with the same facility as that of another; and wool dyes much more uniformly, if the animal has been washed before shearing, than when the washing is performed upon the wool afterwards. Lastly, the wool removed by the liming process before described, will be far inferior in dyeing properties to wool taken from the same kind of animal during life. It may be interesting to some present to know the best method of removing these irregularities. I was engaged during my apprenticeship at the Gobelins in investigating this matter, and I found that the best plan was to steep the wool for 24 hours in lime water, and then to pass it through weak hydrochloric acid. Wool, as it leaves the animal, is not fit for either dyeing or spinning. Thus when wool is washed with water it yields a large quantity and variety of substances, which in France bear the name of *suint*. The most interesting fact connected with this is, that the 15 per cent. yielded by wool does not contain, as shewn by M. Chevreul, any salts of soda, but a large quantity of salts of potash, the greatest part of which is combined with an acid called sudoric; and what increases the interest of this fact is that Messrs. Maumené and Rogelet displayed at the last exhibition salts of potash which they had ob-

tained commercially from this new source. In fact they have established in several of the large manufacturing centres of France, where considerable quantities of wool are used, factories for the extraction of salts of potash from the *suint*, and they supplied the jury with the following particulars:—That a fleece of wool weighing 8 lbs., yielded on the average about 1½ lb. of dry suint, or sudorate of potash, and this would further yield about seven ounces of pure potash. If it is now considered that there is annually twenty million pounds of wool washed in Rheims, thirty millions at Elbeuf, and four millions at Fourmies, it would appear from this quantity that if it were all subjected to Messrs. Maumené and Rogelet's treatment, about 2½ million pounds of pure potash might be recoverable. (For further details on this point see Dr. Hofmann's Report on Chemical Products and Processes in the last Exhibition). Wool which has been simply washed, as above described, is not sufficiently free from extraneous matters to be fit for application in manufactures. It is necessary that it should be scoured, for which purpose, on the continent, it is allowed to remain for some time in putrid urine, or weak ammoniacal liquor, but in this country it is placed in strong alkaline of soap or soft soap, passed through rollers to press out the excess of soap, together with the impurities which it removes, well washed, and dried. In these operations wool loses in weight above 50 per cent. when of good quality, and above 30 per cent. when inferior. But even then the wool still retains a certain amount of fatty matters, which it yields in hot alcohol.

The following table, published by M. Chevreul, will give you an idea of the composition of wool (dried at 212°):—

Earthy matters.....	27 40
Organic and inorganic salts, soluble in water [ <i>suint</i> ] .....	32.74
Fatty matters.....	8 37
Wool .....	31.49
	100.00

Elementary composition, C. 50 66, H. 7.03, N. 17.74, O. 22.32, S. 2.25.

Before proceeding further, I should like to call your attention to the curious fact that the fatty matters of wool are completely different from the fatty matters of the animal itself; thus, whilst the ordinary suet will be saponified by an alkali, the fat of the wool will not undergo that change, the stearine and elearine being only converted into an emulsion. From experiments I have made I am able to state, that the common opinion that the differences in quality observed in various wools are owing to their fatty matters is erroneous, as the pure wool obtained as above yielded to the dyer colours as brilliant as those presented by wools in which a part of the fatty matter still remained. Another important fact connected with the composition of wool is the quantity of sulphur it contains, which does not appear to be part of the fibre, as the matter containing it can be removed by a weak alkali without destroying the fibrous appearance of the wool, although its tenacity is greatly impaired, and its power of taking dye considerably diminished. Another remarkable fact is that when wool is bleached by sulphurous