

FABRIC ANALYSIS.

(Continued from February issue.)

ALPACA.

Alpaca and similar wools are obtained from a group of animals comprising the Alpaca, the Llama, the Vicugna and the Guanaco, and of which the one mentioned first is the most important.

The *Alpaca*, a domesticated animal, furnishes a fine fibre about 6 to 18 inches long, except when the animal is only sheared once in two years, and when the fibre then is considerably longer. Its color is white, gray, brown or black. It is a lustrous fibre, although this lustre is inferior to that of mohair. The outer scales of the fibre are extremely fine, and the central or medullary substance is present either throughout its entire length or in small elongated masses. Fig. 29 shows some of these fibres magnified.

The *Llama* furnished a coarse, long, unelastic, white and brown wool, mingled with true hair.

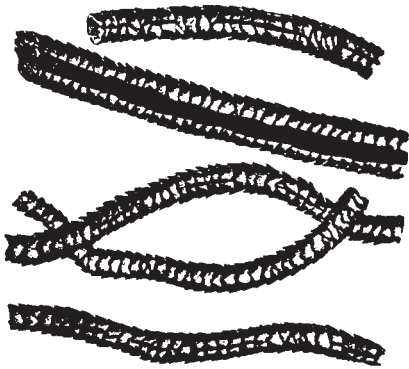


Fig. 29

The *Vicugna* furnishes two different kinds of fibres, viz.: a fine woolly under hair, covered with scales and free from medulla, and a coarse upper or beard hair, having the

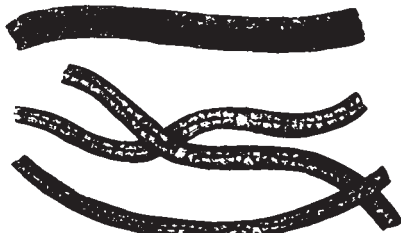


Fig. 30

medullary substance strongly developed. Fig. 30 shows some of these fibres magnified.

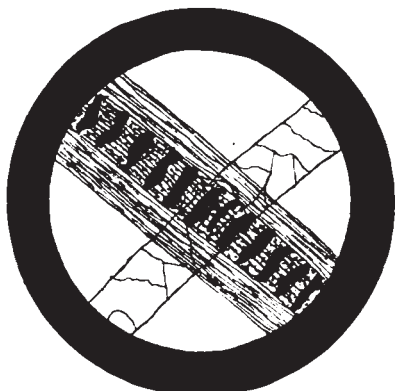


Fig. 31

The *Guanaco* yields fibre of varying quality; however, it is of less importance than the *Vicugna*.

Hair.

CAMEL HAIR is of two kinds, viz.: fine, curly, soft, reddish or yellow brown hairs, about 4 inches in length and

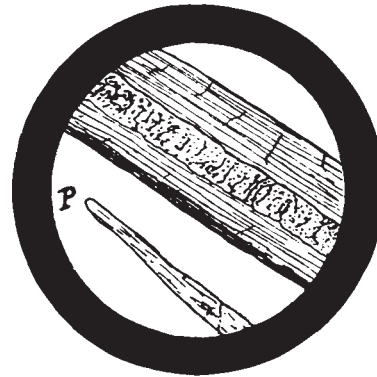


Fig. 32

known in commerce as camel wool, the other being coarse straight, stiff, dark brown to blackish body hairs, about 2 to 2½ inches long, and known as beard hair. Both kinds of hair show (under the microscope) faint scales. The medullary substance always appears in the coarse hair, whereas in the fine hair it is either wanting or appears in insulated masses. Fig. 31 shows camel hair fibres magnified. The fibres from the Alpaca, Llama and Vicugna are frequently referred to in the market collectively as Camels hair.

GOAT HAIR. The Common Goat, when raised in the open air, has a woolly fur which is shed in the spring and which hair is adapted for spinning (with wool) into coarse yarns.

COW and CALF HAIR are coarse, stiff fibres, of a white, reddish brown or black color, possessing a light lustre, and in turn are spun (mixed with low grades of wool) into coarse yarns. Fig. 32 shows a specimen of the fibre, showing the central or medullary portion of it, whereas the fibre indicated by P shows a pointed end of one of these hairs.

HORSE HAIR. Of this, two kinds are met with in commerce, viz.: "tail hair," or the long hair, measuring at least 23 inches, though it occasionally attains a length of 32 to 34 inches, and "mane hair," or the short hair, and which rarely exceeds 19 inches in length. White and black are the colors most esteemed, while red, gray, etc., hair is less valuable.

Artificial Wools.

The same according to their source, are divided into four classes, viz.: Shoddy, Mungo, Extract and Flocks. Of these

SHODDY is the best, being the wool fibre recovered from worn, but all wool materials (known as "softs") which had never been fulled, or if so, only slightly, and which vary in their length from ¾th to 1¼th inches. Shoddy fibres, when seen under the microscope, are sometimes found to be spoiled by scales being worn off, or the ends of the fibres broken. In most instances, dyed shoddy can be detected from similarly dyed new wool in the yarn or fabric, for the reason that the color of the former will betray the inferior article compared to new wool, since the rags or waste, previous to the re-dyeing, except when coming from white softs, had been dyed different colors and which will consequently influence the final shade of color obtained by re-dyeing. Considered all around, with the exception of the two cases quoted, shoddy is hard if not impossible to distinguish from new wool (under the microscope) since a good quality of shoddy does not differ in its fibre structure from new wool and in fact in many cases may be superior to some kinds of new wool. Fig. 33 shows shoddy fibres magnified, clearly showing the epidermal scales characteristic to the (new) wool fibre.

MUNGO is obtained by reducing to fibre pure woollen rags from cloth originally heavily fulled, and when the natural consequence of the strong resistance to disintegration offered by felted fabrics results in that short fibres, about ¾th to 1th of an inch in length, are obtained. Short staple, broken fibres, worn-off scales as well as difference in shade of color, are the only points which can guide you to distinguish mungo from new wool. Fig. 34 shows mungo fibres magnified, showing broken wool fibres, also a jute fibre intermixed.

EXTRACT is artificial wool, produced from mixed rags from which vegetable fibres were extracted by means of carbonizing. An examination of a sample of extract, by means of the microscope, will show traces of the process of carbonizing by means of carbonized vegetable refuse found.

TO TEST SHODDY FROM WOOL.

In testing the presence of shoddy in a lot of woollen yarn or fabric, treat the sample with warm hydrochloric acid, which will remove from the shoddy the color due to its second dyeing and leave its original dye clearly exposed. As the wool present was at the same time stripped of its color, it was left more or less white, thus distinguishing shoddy from wool.

FLOCKS are woollen rags ground in the flock cutter into minute portions of fibres, which then, during fulling the cloth, are made to adhere to, *i. e.*, are felted onto the back (to and into the pores) of the fabric, working their way more or less into the body of the latter.

A good plan to test a fabric as to the amount of flocks it contains is thus: Weigh sample carefully and note its weight. Next take a large white sheet of paper and rub



Fig. 33

the sample by holding it between thumb and forefinger of both hands changing the position of your fingers on the sample frequently so that each portion of the latter receives a thorough rubbing, and when a considerable portion of the flocks (provided the fabric thus tested was flocked) will be liberated and drop onto the paper. Dissecting sample, *i. e.*, separating warp and filling, will liberate an additional amount



Fig. 34

of these flocks, more particularly such as had worked their way into the interstices of the structure. Take each thread, whether warp or filling, as picked out by you, and liberate all flocks possible from the thread by pulling it between the thumb and forefinger of one or the other hand, using one or the other of the finger nails for scraping off flocks as may adhere to the particular thread. Weigh the refuse thus rubbed from the fabric and its weight compared to the original weight of the sample previously referred to will give you (figuring by proportion) the per cent of flocks the fabric contains.

SILK.

True Silk as well as Wild Silk is met with either as thrown or spun silk. The latter is readily distinguished from the former by its broken-up lengths of fibres composing the thread, caused by its manufacture into yarn.

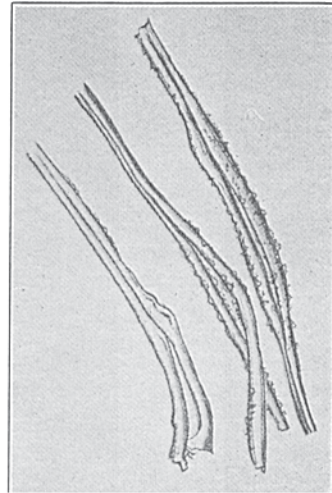


Fig. 35

TRUE SILK, when in its natural or gum condition, consists of a double fibre, and viewed under the microscope has the appearance of two fibres cemented together at intervals as it emerges from the silkworm. Fig. 35 shows (magnified) cocoon fibres of Canton silk with the gum still attached.

When degummed, or boiled-off, the two individual fibres are separated as shown in Fig. 36, which in its right hand

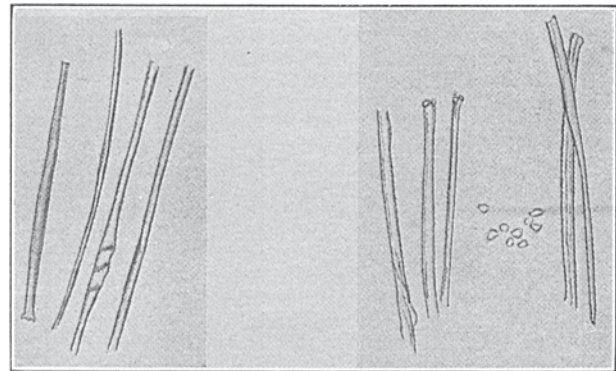


Fig. 36

photograph also shows cross sections of fibres. From illustrations it is seen that the surface of the fibres is smooth, transparent and structureless, with occasional little nodules in the side of the fibre. It resembles a cylindrical glass rod, in some portions uniform in thickness, while at others of somewhat irregular diameter.

WILD SILK (or as more often called *Tussah* silk and which is the most prominent variety of wild silk) differs

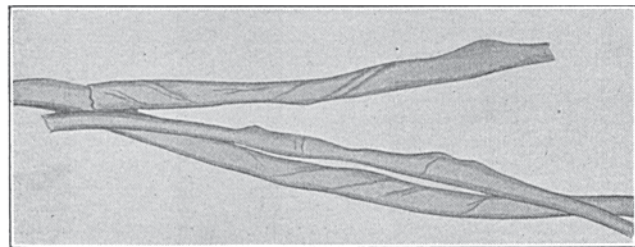


Fig. 37

from true silk in being much coarser in diameter. Under the microscope the fibres show numerous longitudinal striations. Occasionally, characteristic broad diagonal markings across the surface are seen and which are due to the impression left by another thread upon the fibre. Fig. 37 shows Tussah silk, boiled-off, clearly revealing those diagonal markings previously mentioned. Wild silk has a dark color, which cannot be removed except by means of a powerful bleaching agent; its lustre, softness and elasticity is inferior to those of true silk.