

Musk-Ox Wool and Its Possibilities As a New Textile Fiber

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(Continued from Sept. issue, p. 474)

Microscopical Examination

Wool Hair.

The hair, like the merino wool fiber, consists of the epidermis and the cortical layer. Medullae are very seldom found. The scales are clearly visible especially those of the light fibers. (See Figure 2.) The num-

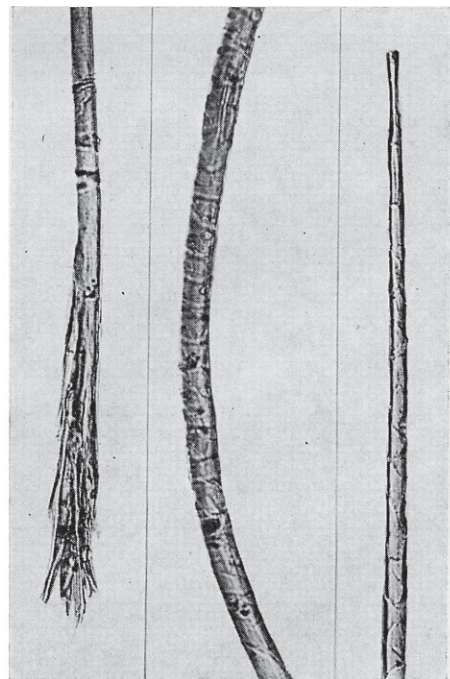
shedding time shows the root end as well as the fine tapering end. (See Figure 4.)

Fineness.

As it is impossible from such small samples, which I have from a few animals, to get an accurate aver-



Fig. 2. Musk-Ox Wool (240 X)



Root Hair Body End
Fig. 4. Musk-Ox Wool (240 X)

ber of scales per 100 microns (0.1 mm or 1/250 inch) lies between four and nine, the average being six. (See Figure 3.) In the dark hairs, the cortical layer is covered with grey-black dyestuff pigments mostly in patches. The hair taken from the animal during the

age sample, the fibers were measured (with a few exceptions) on the root end, that means, about a half a centimeter above the skin. This method, although the best from a scientific standpoint and more and

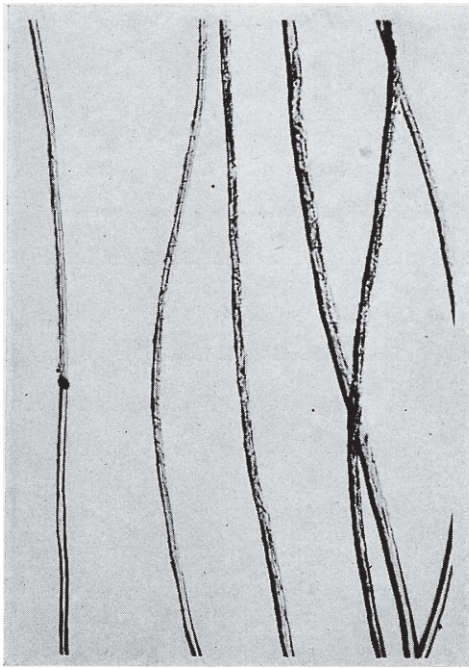


Fig. 5. Musk-Ox Wool (120 X.) Near the skin



Fig. 6. Musk-Ox Wool (120 X.) Middle part gray

more used by the sheep breeder, cannot be used for half-manufactured, or finished goods, as it is impos-

or two microns too high, as all the fibers are much finer at the root end than in the middle or upper part of the staple. This is best explained by the following examples, and it can be seen from Figures 5 and 6.

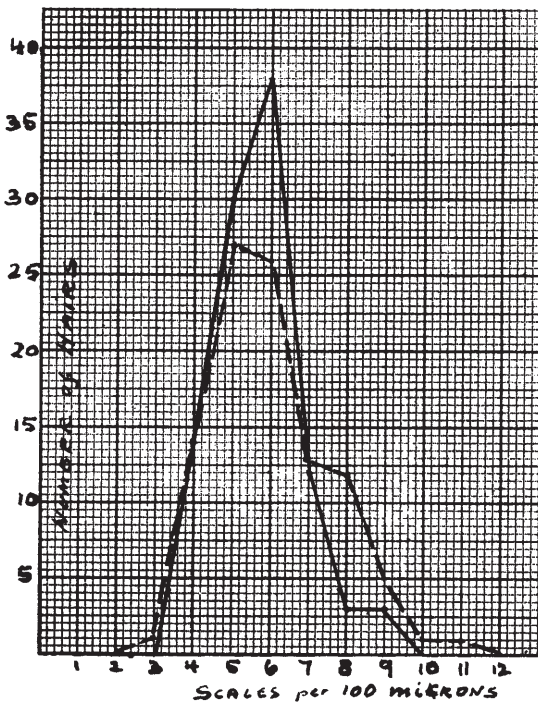


Fig. 3. Scales Curves Musk-Ox Woolhair Scales per 100 microns.—New York
— — — Alaska

	Musk-Ox Wool		Australian	
	Shoulder	Back	Cashmere	Merino
Root End	11.55 μ *	11.25 μ	14.25 μ	15.33 μ
Middle Part....	13.65 μ	15.77 μ	16.63 μ	18.22 μ

*1 μ or micron equals 0.001 millimeter or 1/25400 of an inch.

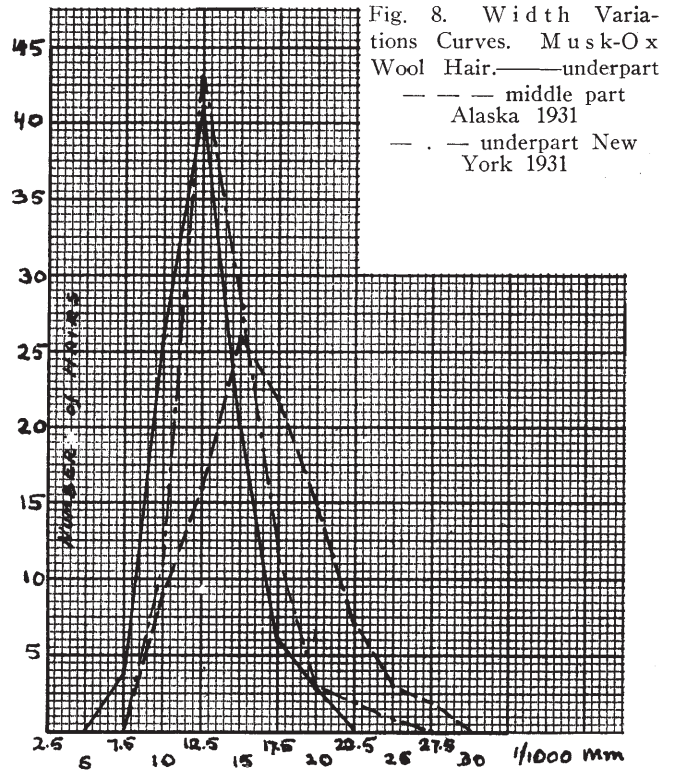
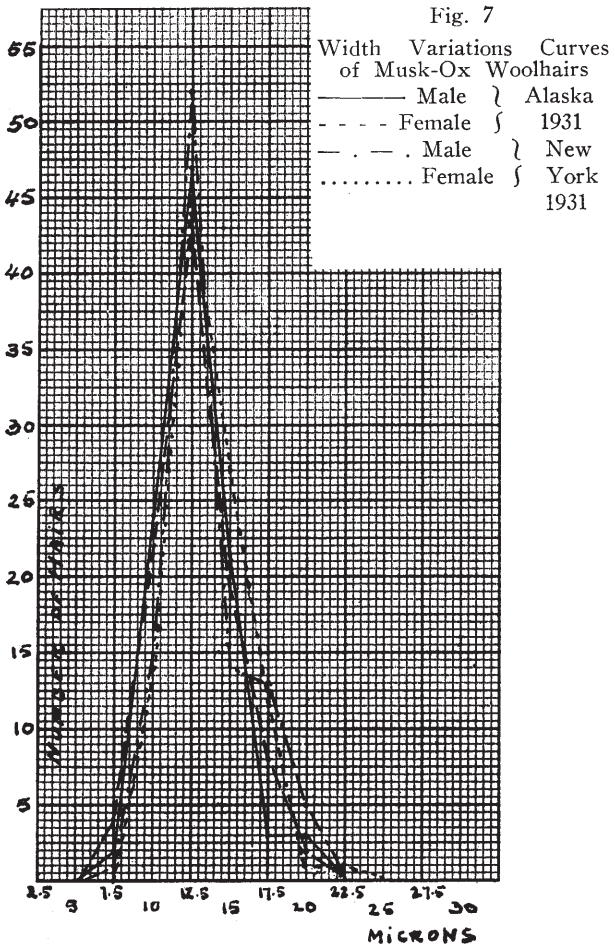
The width of the musk-ox wool hair was found to be extremely regular and extremely fine. The values are given in Figures 7 and 8.

Measurement of the Fineness.

Number of Hairs	Sample Alaska Feb. 1931		Sample New York June 1931
	Root End	Middle Part	Average Width Root End
100	11.55 μ	13.65 μ	13.00 μ
300	11.36 μ	15.40 μ	12.78 μ
500	11.43 μ	15.28 μ	12.78 μ

It is an interesting fact that the hairs grown in New York are all one micron coarser. This difference may be caused by the climatic conditions. In this connection, we have a similar thing in the length of the staples, see Table I, from which we see that the New York wool is much shorter, although it is one year's growth compared with nine months growth of the Alaska wool. In the much warmer New York climate, the animals do not need such a heavy down, so nature automatically takes care of the change in conditions. No difference was found between the

sible, from the scoured wool on, to find the root ends. The fineness found after this method is always one



fineness of the wool grown on the male and female, nor between the hairs from the shoulders and back of the animals.

	Sample Alaska		Sample New York	
	Male	Female	Male	Female
Shoulder	11.50 μ	11.43 μ	12.20 μ	12.85 μ
Back	11.55 μ	11.25 μ	12.95 μ	13.05 μ

The cross section of the fiber is practically circular, as can be seen in Figure 9, and, therefore, the direct measuring of the width is accurate enough.

Beard Hairs.

The beard hair consists of three parts, the epidermis, the cortical layer, and the medulla. The medulla constitutes on the whole the larger part of the hair. The root and the extreme end do not contain any medulla. Partially medullated hair rarely is found. Figure 10 illustrates two beard hairs with roots and ends. Many ends of the beard hairs are split in two or three parts similar to those seen in Figure 10.

Fineness.

The width of the beard hairs is extremely irregular,

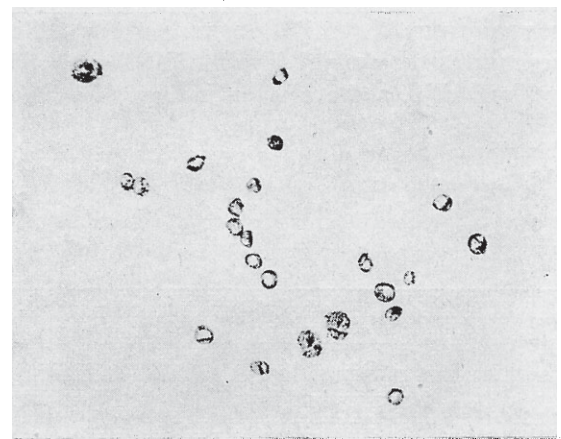


Fig. 9. Cross-sections Musk-Ox Wool (120X)



Fig. 12. Cross-sections Musk-Ox Beardhair (120X)

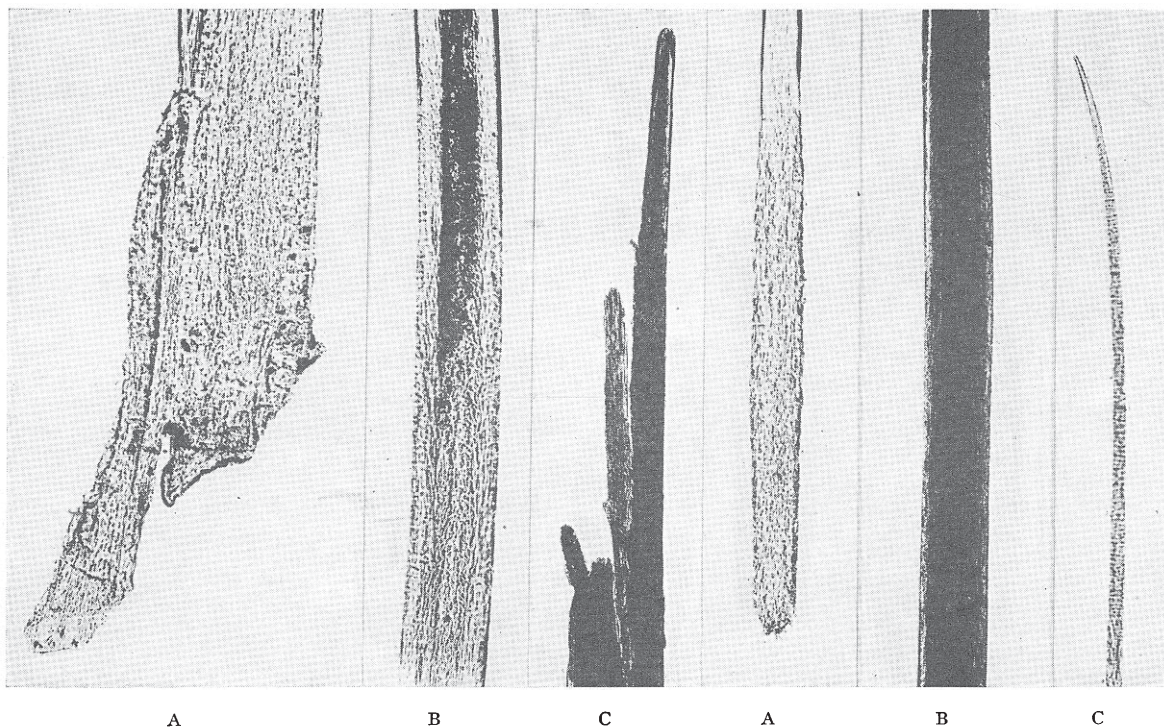


Fig. 10. Musk-Ox Beardhair. A. Root. B. Hairbody. C. End (65X)

they vary from 25 to 225 microns. The following values were determined from 300 hairs, Sample New York 1930, and are given in diagram Figure 11.

Number of Hairs	Average Diameter
100	104.1 μ
200	100.4 μ
300	94.9 μ

show in the medulla empty spaces which are caused by the spongy cell-like nature of the medulla. These spaces are filled with air, which gives the uncolored beard hairs or kemp fiber its snow white appearance. The true fineness of the beard hair should be determined from the cross-section on account of the elliptical and band-like forms. For practical purposes, how-

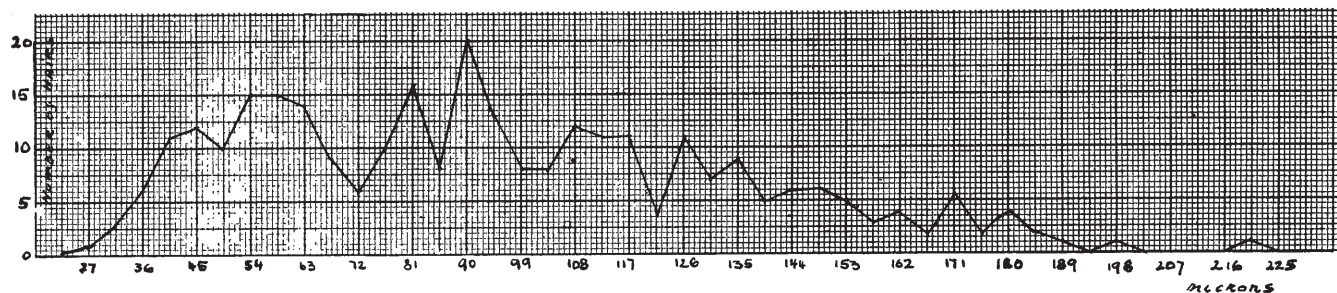


Fig. 11. Width Variations Curve of 300 Musk-Ox Beardhairs

The cross-sections of beard hairs vary in form, from sections with very flattened sides to those which are circular. (See Figure 12.) Some of the sections

ever, the ordinary microscopical method of measuring the width is sufficiently accurate.

(To be continued)