

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

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(Continued from Oct. issue, p. 556)

Chemical Nature and Properties

The raw musk-ox hair contains about 8% fat and the possible yield in the clean material, judged from the few samples which I had, will be around 80%.

The affinity to wool dyestuffs is equal to any other wool. The brightness of the shades is limited because of the natural gray of the wool. Through bleaching this natural color can be lightened to a very light tan, but not entirely removed. The fiber is more sensitive to chemicals, alkalies and acids than wool due to the high fineness.

Differentiation Between Related Hairs

As the animal is a species which has no direct relation to any of the wool bearing animals, we are only able to decide to which technical hair it comes nearest by studying the microscopic structure of the fiber. Deputy Minister Cory of the Northwest Territories, Canada, wrote me the following:

"The hair of the Musk-Ox is similar to that of the Thibetan Yak, possibly coarser."

Thibetan Yak

The wild and domesticated ox (*Bos Grunniens*) of the Thibetan plateau is known by this name and is a species nearly allied to the bison group. The wild yak, generally black, is found near the snowline. The

domesticated species, usually half-breeds, is of various colors, black and white being most common. The yak is about the size of a common ox, but is covered with a thick coat of long hair, hanging down like the fleece of a goat, completely investing the tail and forming a lengthy fringe along the shoulders, flanks and thighs. This fringe which exists in both species was apparently developed as a protection for the animal in its Alpine haunts, as the long hair forms a sort of mat, which defends the body from the effects of the cold, when the animal is reposing in the snow. The domesticated species is of great importance to the natives of Thibet. The yak is employed as a beast of burden, but never for tillage or draught. It yields a very rich milk and an excellent flesh.

Through the courtesy of Prof. Gasser of the Alaska College, I secured a sample of male yak hair from an animal which is kept at the Fairbanks station. The yak coat also consists of an outer covering of dark brown or black beard hair, and an under coat of brown wool hair. Judging by the sample, the down consists of very short and not particularly fine hair, about one inch in length, varying from 13 to 35 microns. The variation curve is seen from Figure 13. The average of 300 fibers is 21.25 microns, equal to quality 64. Because of the strong pigmentation of the fibers, the scales are hardly seen, which is proven by Figure 14. The number of scales is about 10 per 100 microns. The beard hairs are mostly straight and are very dark brown or black. Under the microscope they show no special difference against any known beard hair. Their length is about three to four inches. The fineness is seen from Figure 13 and fluctuates between 27-85 microns, the average being 46.2 microns. The beard-hairs of the yak are also much finer than the musk-ox beardhair, for this reason I assume that the statement

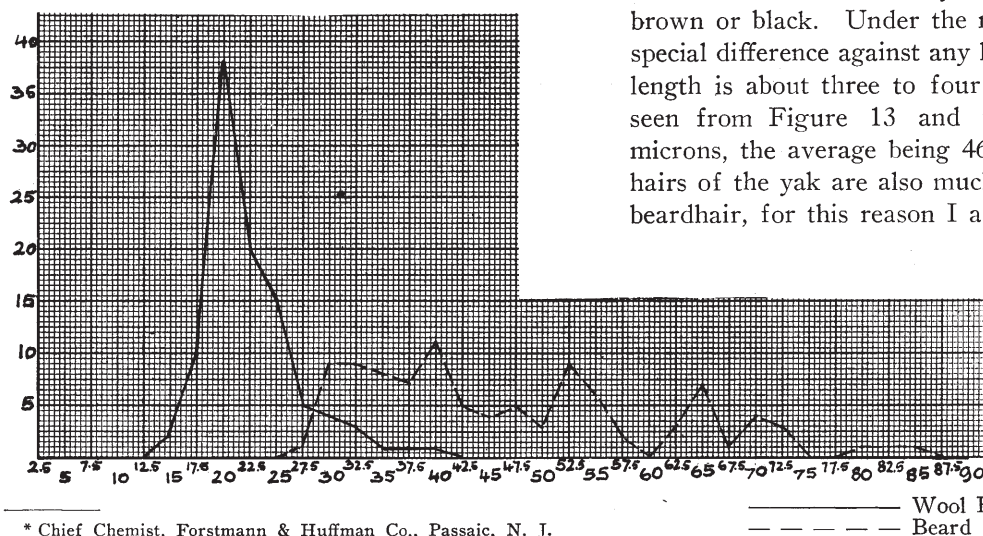


Fig. 13
Width Variation
Curves of
Yak Hair
Wool Hair } Alaska
Beard Hair } Male Shoulder

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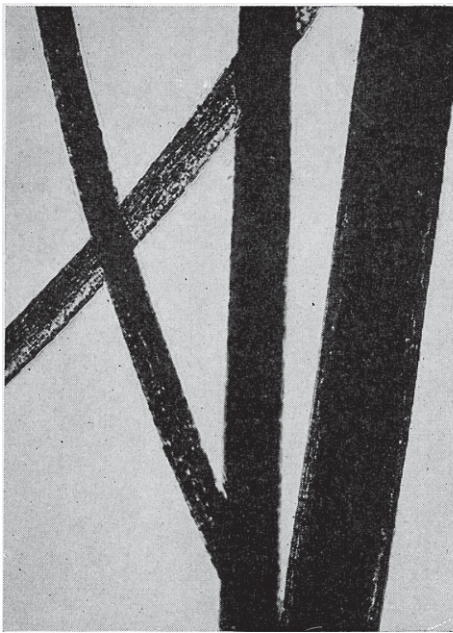


Fig. 14. Yak Hair (240 X)



Fig. 16. Musk-Ox Wool (240 X)

from Deputy Minister Cory refers to the outer coat of the animal.

The wool hairs are not nearly as valuable as the musk-ox wool hair. The hair is spun into ropes and made into coverings for tents by the natives of Thibet, and the soft fur of the hump and withers is woven into a fine strong cloth. The tails, often dyed red are made into chowies or fly-flappers, used in India. In my opinion, one cannot speak here of any great similarity. Therefore, in the following Table II the properties of vicuna, cashmere and camelhair, technically used hairs, are noted for comparison, at the same time the variation curves of the three are seen from Figure 15, and

the microphotographs Figures 16, 17, 18 and 19, show clearly the difference in the structure of each fiber.

TABLE II

WOOLHAIR	MUSK-OX WHITE FACED	VICUNA	CASHMERE	CAMEL (Fine)
Color.....	Gray White gray	Brown	Wh.-gray Brown	Red brown
Luster.....	Good	Good	Good	Good
Handle.....	Extra soft Silky	Extra soft Silky	Extra soft Silky	Soft Silky
Lengths.....	1½-6"	1¼-3½"	1-5"
Bulk.....	3-5	2	2	2½
Waviness....	Curly	Curly	Curly	Curly
Scales per 100 Microns....	6 Visible	7-9 Poorly visible	6-7 Clearly visible	9 Poorly visible
FINENESS				
ALASKA				
	Root	Middle		
Under 15 mic.	91%	51%	79%	39%
15-25 mic....	9%	47%	21%	52%
Over 25 mic..	0%	2%	0%	9%
Average.....	11.4	15.3	13.4	17.5
	μ	μ	μ	μ
QUALITY				
English.....	140	100	120	100
Medullated Fibers.....	None	Numerous	None	Numerous
BEARD HAIR				
Color.....	Brown and Black	Brown	White Br. & Blk.	Brown
Length, Inches	1-16"	8"	1½"-5"	2-5"
Fineness Average....	100μ	75μ	60μ	60μ

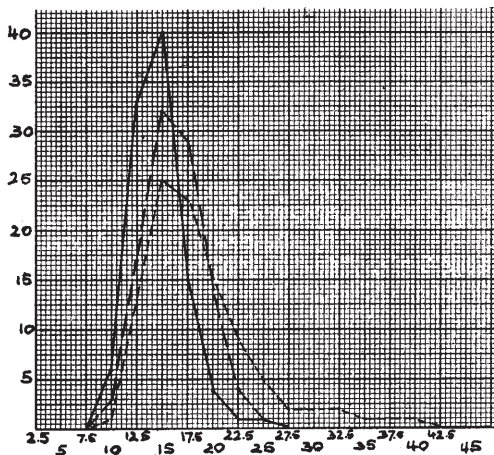


Fig. 15. Width Variation Curves of
 ————— Vicuna Wool Hair
 - - - - - Cashmere Wool Hair
 Camel Wool Hair

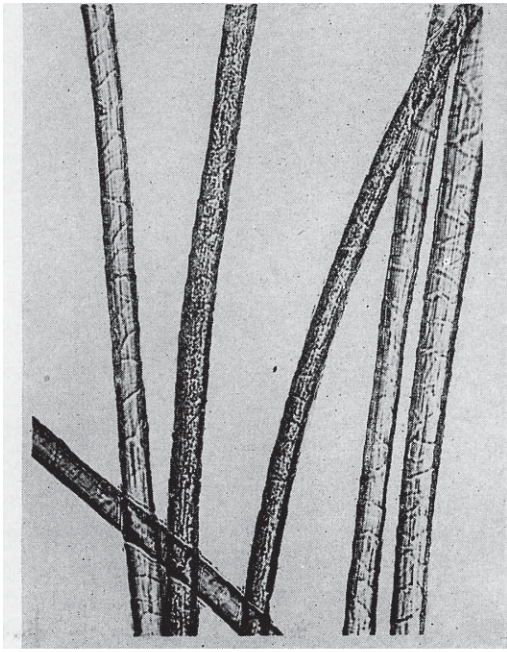


Fig. 17. Cashmere (240 X)

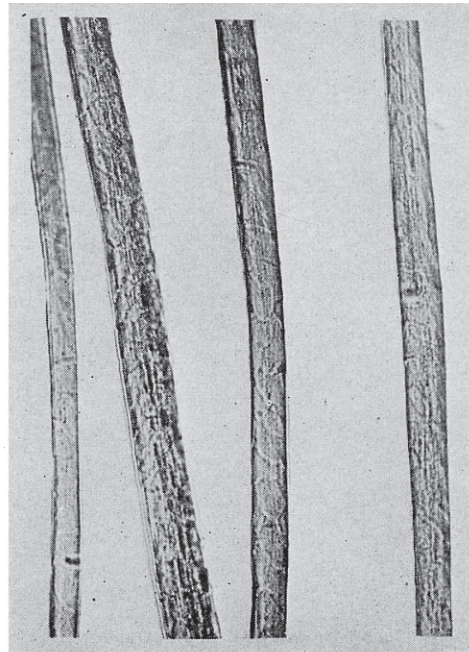


Fig. 19. Camel Wool Hair (240 X)

From this table and Figures 15-19, it can be seen that the musk-ox wool hair from the back and shoulder parts comes closest to the cashmere wool hair in its microscopic structure and as far as fineness points are concerned, it is even superior. In a blend of these two

scope to separate the fibers for an accurate analysis.

Unfortunately I have not as yet been successful in obtaining a raw sample of vicuna but it is my belief that the musk-ox wool hair, growing on the shoulders



Fig. 18. Vicuna Wool Hair (240 X)



Courtesy: J. E. Dollmann, British Museum Natural History, London
Fig. 20. Cashmere or Shawl Goat

of the animal is the finest wool hair which is known today.

(To be continued)