MOHAIR AND MOHAIR MANUFACTURES.

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PURPOSE OF THIS ARTICLE.

The purpose of this article is twofold: (1) To call the attention of the breeders of Angora goats to the weak points of their animals as mohair producers, with suggestions as to measures for improvement, and (2) to call the attention of people generally to the great beauty, durability, and comparative cheapness of mohair manufactures, with the view of encouraging a stable and more extensive use of these goods.

FLEECE OF THE ANGORA GOAT.

Mohair is the technical name for the fleece of the Angora goat. It differs from the wool of the sheep in that it does not have the felting properties of the latter. The felting property of wool is due to the presence of scales, or epithelia, which cover the fiber in much the same manner that scales cover fish. It is the felting property of wool which distinguishes it principally from other animal fibers. Mohair is a hair proper, being devoid of scales, and so is not successfully used alone in felt goods.

The fleece upon the goat is pure white, is exceedingly lustrous, and grows to an average length of 10 inches annually. It hangs in beautiful wavy curls, or ringlets, from all parts of the body, if the animal is of the best breeding. The average annual production per head of mohair is about 4 pounds. The grade of the goat has much to do with the weight of the fleece. The first cross of an Angora buck upon a common doe gives but a small amount of mohair, but the increase in quantity is notable as the crosses become higher. (Fig. 26.)

In Turkey, in South Africa, and in most States of the Union, shearing is done annually, as with sheep; but in the southwestern part of the United States, where probably the greater number of the flocks are located, the goats are sheared twice a year. This practice is due principally to the long warm season, which causes the goats to shed if they are not sheared; but feeding and careful handling will do much to prevent shedding, even though the warm season may be severe and long. It is not infrequent that goats are found in the Southwest carrying an annual fleece, and occasionally there is one having a fleece of eighteen months' to two years' growth. The great mass of them, however, will drop the fleece if it is not sheared semiannually. Of course,

these semiannual clips are much shorter in length than the annual clips, and therefore are not so valuable in the market. While the semiannual clips together average a little heavier than the annual clip, the difference is not sufficient to compensate for the added care and expense of shearing and the reduced price.

As just intimated by reference to the length of the clip, it is quality that gives to mohair its relative value. The manufacturers desire a long fiber, very fine, and strong. While there are uses for coarse grades of good length, the price is not so large as for the finer grades.

FIG. 26.—Imported Angora goats. (Photograph furnished by W. M. Landrum.)

The finer fleeces are produced by kids, wethers, and the younger does. The fleece of all Angoras grows coarse after the goats are six years old, beginning even earlier than this with bucks. The finer grades of mohair are used principally in the manufacture of plushes and the coarser grades in dress goods, coat linings, etc. Feeding has much to do with the length and strength of mohair as well as with the weight of the fleece. The colder climates also increase the fineness and add to the weight.

The table following, which is compiled from a "Report of examination of wools," etc., by Dr. William McMurtrie, and published by

the Department of Agriculture in 1886, gives a very interesting comparison between length, fineness, strain, and stretch of mohair and commercial grades of wool:

A comparison of mohair and wool fibers.

Description.	Length.	Fineness.		Strain.		Stretch.	
	Inches.	*Centi-millime-ters.*	*Thous-andths of inch.*	*Grams.*	*Grains.*	*Millime-ters.*	*Per cent.*
Mohair (average of 480 tests) ...	6.91	3.157	1.2429	19.12	295.11	10.60	26.50
Commercial wools (average of 1,410 tests)	2.62	2.118	.8352	7.01	108.79	5.02	25.11

It will be observed that mohair is not equal to wool in fineness, but in strain there is a difference much greater than would be suggested by the larger fiber. The average wool fiber in these tests stood a strain of 108.79 grains, while the average mohair fiber stood a strain of 295.11 grains. This is a difference of 186.32 grains—much more than double the strength of wool. It is to this strength of fiber that the great durability of mohair goods is ascribed. In stretching quality there is but a slight difference between mohair and wool. Dr. McMurtrie makes the point in discussing wools that the individual fibers may be variable in size, a condition brought about, it is supposed, by sudden changes in weather or feed, or by ill health. Dr. McMurtrie's remarks on this question are applicable to mohair, and so are copied here somewhat extensively:

In the study of the wools constituting the collection under present examination, one can not avoid being struck with the lack of what the German authorities term *Evenness Treue*, or uniformity in the diameter of the fiber throughout its length; and this property is probably one of the most important, if it does not even stand first, in the determination of the commercial and industrial value of the staple. It is the result of two causes—the one atrophy of the fiber at certain parts, the other hypertrophy. In other words, when we examine a sample of uneven staple with the microscope, we notice a greater width of the images at some parts than at others, and these variations are by no means wanting in interest, nor are they absent in many of the animals said to have received excellent care and feed. In some cases we find a sudden contraction of the fiber at certain points (atrophy), and this is often sufficient to give the edge of the image a decidedly notched appearance. In other cases the contraction is more gradual, the progressive diminution of the width of the image extending over a greater length of the fiber. In the enlargement, however (hypertrophy), such sharp variations do not obtain; the fiber begins to enlarge at a certain point, and the enlargement may continue through the length of the fiber until it attains a diameter even twice as great as at other parts. * * *

Where atrophies occur the fiber must necessarily be weakened, while, on the other hand, staples in which the atrophied fibers occur in any important proportion must interfere with the regular passage of the material through the several machines and processes of the factory. In both cases, therefore, they seriously impair the value of the products, and it behooves growers to look to the causes which may have a tendency to bring them out. What these causes may be we have had no opportunity

to determine, but there can be little doubt that bad nutrition, exposure, and consequent impaired health or constitution are the more prominent. A fevered condition of the system probably tends to check normal exercises of the functions of the skin, and hence the growth of the fiber resulting in atrophy, or it may have the contrary effect and cause hypertrophy. * * * We have sufficient evidence to show that when animals have been well fed and cared for, and when the health of the animal has been uniform, such deformities in the fibers do not exist. And that the growth of the wool is retarded, or at least that the diameter of the fiber is diminished by impaired health of the animal is well illustrated in the following bit of our own experience. On one occasion a prominent breeder of Merino sheep submitted a sample of his wool for the determination of its fineness. By the system of measurement followed we found that the fibers were finer at a certain part or point in their development than at others, and by simple calculation it was easy to determine at what part of the season the finer portion of the staple had developed. We stated that at that season the animal must have been in ill health, and this was afterwards confirmed by reference to the record of the condition of the different individuals of the flock during the year. And it further illustrates the importance of great care in the management of sheep and the value of protecting them from any sudden changes, and from the inclemencies of the weather in general.

All mohair has a luster peculiarly its own, but this is much more pronounced in some fleeces than in others. That having the higher luster, other qualities being equal, commands the better price. A fleece of low luster indicates a goat under influence of adverse conditions, as poor breeding, poor feeding, or sickness. The uninformed often express the opinion that this luster is due to oil in the fleece, but this is erroneous. Whatever oil there may be in mohair is inside the individual hairs, and not on the outside, as in the case of wool. A mohair fleece may be washed, then scoured, and then steamed, dyed, and worked up into fabrics after reaching the mills, but none of these processes removes any of the luster; indeed, all of them operate simply to intensify it.

PRESENCE OF KEMP IN MOHAIR.

It is a fact well known to breeders that the Angora goat has two coats of hair. The outer and more abundant coat is the mohair, while the under coat is a coarse, chalky white, straight, stiff hair, varying in length from one-half to 4 inches. This under hair is known by the name of kemp. It is generally believed to be the relic of the common goat blood in the Angora, for it is a matter of history that the Angora flocks of the United States, as well as those of Asia Minor and South Africa, have been largely increased by crossing upon the does of common blood. This has been done to such an extent, indeed, that it is no longer contended that there remain any Angora goats of absolutely pure blood. This disbelief in pure blood is based upon the fact that the first cross of an Angora upon a common doe yields a fleece in which kemp largely predominates, and that as the crosses become higher the quantity of kemp grows less. That point has not yet been reached, however, where it can be said that a strain has been produced

which has no kemp whatever, although a few breeders in this country and in South Africa appear to have very nearly reached that very desirable result. This is the principal end to which breeders should lend their best efforts at this time. It is the most difficult quality to obtain. Length, strength, fineness, and luster may all respond readily to the intelligence of the breeder, but kemp is stubborn. The hope is confidently expressed by the best breeders that a strain of Angora goats will yet be produced which will be entirely free from kemp.

The spirit of the goat men who met in Kansas City on October 24–28, 1901, in attendance upon the meetings of the American Angora Goat Breeders' Association, showed that they were not only willing but anxious to undertake the solution of this problem. While all these men were familiar with kemp and knew that it was a deleterious feature of mohair, not many of them knew before this meeting was held how objectionable it really is to the manufacturer, and consequently how much it tends toward keeping the price of mohair low.

At Kansas City the mohair producer and the mohair manufacturer met each other for the first time in this country, the presence of both being in the interests of the Angora goat industry. George G. Emery, of Sanford, Me., addressed the association on three occasions during the week, his theme each time bearing upon the quality of fiber required by the manufacturer. He displayed a large assortment of goods, using them to supplement his argument concerning the uses and value of good mohair as compared with the poorer grades. The writer of this article, representing the Bureau of Animal Industry, also addressed the association along the same lines. The goat men showed a disposition to learn all that is required by the manufacturers, and determined to redouble their efforts toward a higher standard for their flocks. The large price of $1,050 was paid for the buck Columbia Pasha at the Kansas City goat show, principally because of his freedom from kemp. It is true that his fleece was fine and long and his body was fully covered, but the appearance of the animal as he stood in the pen (his size and carriage), although he was a "good looker," had comparatively little weight with the judges, who gave to him the sweepstakes prize as the best buck of all ages in the show.

WHY KEMP IS OBJECTIONABLE.

The reason why kemp is objectionable is that it will not take the dyes used for mohair; the only effect of the dyes is slightly to discolor the kemp. There are dyes, it is true, which act upon kemp, but they have no effect upon mohair; and the best efforts put forth have not yet resulted in a mixture of dyes that will act satisfactorily upon both mohair and kemp at the same time. The only solution, therefore, is to remove kemp from fleeces which enter into the manufacture of fabrics in which it is undesirable.

Kemp appears in its worst phase in plushes, where every individual hair shows prominently. Its presence here is much more pronounced than when in the fleece, where it is nearly of the same color as the mohair. It is therefore of great importance that this objectionable substance should be removed from the fleeces. If any kemp should escape the eye and be woven into the plush fabric it would not be discovered until the fabric came from the dye; for it must be remembered that mohair plushes are woven "in the white," and afterwards (perhaps several months or a year) are dyed according to instructions to fill orders. Kemp, at this stage of the process, becomes an expensive proposition, for skillful hands must burl out every fiber of it as well as every other bit of foreign substance. In the cheaper plushes, such as are largely used in street cars, there is a considerable quantity of kemp. Much of this material may also be used without detriment in the manufacture of rugs.

The problem of the mohair manufacturer is the same as that of the mohair grower—how to get rid of kemp; and the burden of his meditations is to devise some sort of machinery that will do the work perfectly. American ingenuity has so far failed to invent such a machine; and so the manufacturer finds it necessary to call upon the breeder to produce mohair without kemp. The solution of the problem, therefore, appears to be with the breeder rather than the manufacturer.

But the fact remains that the mills must get rid of kemp in some way, and the device which they use for the purpose is a machine which combs it out; but while the comb is removing the kemp it removes at the same time every mohair fiber of equal length with the kemp. This means that if the mohair going into this comb has kemp 3 inches long all mohair fibers up to 3 inches in length must go out with it. The result is heavy loss. True, there is a use for this mixture of kemp and short mohair, as heretofore stated, in the manufacture of cheap goods, such as horse blankets and filling for carpets, and also for stuffing saddles, and it has a value ranging from 7 to probably 10 cents per pound. From the breeders' standpoint this residue from the combs will be considered as a loss, and he must figure it as wastage. This wastage runs from 5 to 40 per cent. It is eminently proper to quote here the opinion of one who has spent many years in fabricating mohair, namely, George B. Goodall, of Sanford, Me.:

A majority of the mohair growers in this country little realize how much kemp has to do in keeping down values of their clips. If they could spend a few hours in our sorting and combing rooms, the lesson learned would be of great value to them—more than could be obtained by reading. In watching the combs at work they would notice some making 5, 10, or 12 per cent of noil or waste, while others will be taking out 30 or 40 per cent. Ask the comber the reason of this, and he will reply that one lot has a much larger amount of kemp than the other. One fiber of kemp takes out five or six good fibers which should go into yarn.

The thought has probably already occurred to the breeder that the longer the kemp the greater the wastage. But how can kemp be shortened? is the question of importance next to getting rid of it altogether. It is generally accepted as a fact that long kemp is evidence that the animal producing it is bred up from long-haired Mexican does, while short kemp is a relic of short-haired does, such as are quite common in suburbs of large cities. If this be true, the point is already made that, in building up a flock from common does as the foundation, none but short-haired ones should be used.

Let it be said in passing, however, that there are so many thoroughbred and high-grade Angoras in this country now that the reason or necessity for crossing upon common goats does not exist as it did several years ago. To continue the practice is to continue the injection of kemp into Angora blood. The crossing upon common stock has been done with the double purpose in view of increasing the flocks more rapidly and of infusing stronger blood into the Angoras. As stated above, the necessity for the first is probably past; with regard to the second, it can be said that there are now in the country strains of Angoras which are as large and vigorous as any common goats may be. These might be used to impart constitution to the delicate flocks.

Finally, concerning kemp, its presence in mohair is not objectionable on the score of durability, for it has lasting properties, but its coarseness and its inability to take mohair dyes make it undesirable.

DURABILITY OF MOHAIR.

The durability of mohair and mohair manufactures is well known to those who are familiar with their use. Statements which to some may seem incredible are on record, but there is no good reason to doubt their accuracy. S. Holmes Pegler, author of the excellent English work, "The book of the goat," states that in 1881 the Duke of Wellington imported a half dozen Angoras from the Cape, and many of the clothes worn by the duke were from the fleeces of these goats, and he continues: "I myself possess an overcoat cut from the same stuff, presented to me by his Grace, which promises to be everlasting as regards wear." Dr. James B. Davis, who first introduced Angoras into the United States, having himself brought them from Asia Minor, says in an article which he published in the Annual Report of this Department for 1853: "I have socks which I have worn for six years and are yet perfectly sound." A friend of the writer states that he has had one mohair rug at his office door for twelve years, and it does not yet show much wear, while the luster and color remain as distinct as when new. Ladies who have worn mohair crepons and brilliantines are all aware of the wonderful durability of this fiber.

Strange as it may appear upon first thought, it is the durability of

mohair dress goods that has prevented their more extensive use heretofore. The first cost being somewhat high, they have not generally been worn by people whose principal aim is durability in the purchase of clothing. They have been subject to the caprices of fashion, being "all the style" one year and "out of style" the next. This has naturally restricted their use largely to that class of people who could afford to discard them before wearing them out.

Even though the first cost of these goods may be high, their use would prove economical for that class of people who desire good quality and good appearance without affecting the highest degree of fashion. They will preserve their color to the last and the luster will never disappear.

INFLUENCE OF FOOD AND CARE OF GOATS ON FIBER.

Any wool grower knows that feed and care have a very great influence upon the weight and fineness of the fleece. The same is applicable to mohair growing as well. If goats are exposed to sudden changes of weather the effect is shown in the fleece. Under adverse conditions an individual mohair will show contractions, which greatly reduce its "stretch" and "strain." This point is fully covered in the quotation from Dr. William McMurtrie, on page 273, and need not be further mentioned here.

John S. Harris, one of the early breeders of Angora goats, and who is a man of good observation and rare judgment, says that the finest and evenest mohair is from goats which feed upon grass. He says that brush is "pie" to goats, and a little pie will do no harm; but all pie is not good. While this is contrary to the opinion of most breeders, the experience of one who has so long been raising goats should not be hastily cast aside.

S. C. Cronwright Schreiner says:

> If goats are to produce the best fleeces they are capable of they must be maintained in uninterrupted good condition. They must have a variety of food, principally shrubs and aromatic plants, and lead an active life; they must, if possible, have running water to drink, and be kept free from dust; they must not be kraaled (or shedded) except when absolutely necessary; they must have clean sleeping places, and must not be crowded together.

It is the opinion of the writer that the many important points concerning the length, strength, and fineness of fleeces should be the subject of scientific experimentation, which experimentation should include the effects of feed and climate. The results of an investigation of this character would answer as well for the sheep industry of our country, with its annual wool production of 289,000,000 pounds, as for the growing mohair industry; for the same conditions govern with both fibers.

PRICES OF MOHAIR.

A long chapter might be written about the reputed prices obtained for mohair during the first few years after the introduction of Angora goats into this country; but as there were no mills in this country at that time which were able to fabricate the fleeces, and as the quantity of mohair produced was very limited and of uncertain quality, and as there appears to be no definite data available of sales made at the enormous prices which are sometimes referred to, it would seem that no useful purpose will be subserved by discussing the prices of that period. Attention will be given, therefore, to the prices of the present, for these are the prices which interest the mohair growers of to-day.

What has been said in previous paragraphs about varying qualities of mohair has no doubt suggested the thought that prices also are very variable, which is true. It is not the quality alone which affects the price, but supply and demand, which affect all articles of commerce, play a very important part. It was decreed by Dame Fashion last year, for instance, that mohair dress goods were not in style, and the effect of this decree was to reduce the value of mohair. Other causes, a principal one of which was a very limited demand for car plush, also contributed to the cause of low prices.

To give a brief answer to the question, What is mohair worth? is not possible. There are more grades of mohair than there are of wool, and there has so far been no effort on the part of mohair producers to so sort their fleeces as to enable them to receive the highest price for each class, but they have been content to sell it in one mixed lot. This always tends to reduce the price below its real worth, because the purchaser, not knowing exactly what he is buying, protects himself with a low price. The features that make for low prices are shortness and coarseness of fiber, and the presence of kemp, burs, and dirt of all kinds. There were on exhibition at the Kansas City show some fleeces which looked as if they might have been raked out of a filthy hogpen; these had been sold at 7 cents per pound, while other fleeces in the same exhibit were worth 40 cents per pound.

Probably the average price paid for mohair during the past season was about 25 cents per pound. The product of the lower crosses, which contains a large percentage of kemp, brings a low price (10 to 15 cents), while there were some fleeces that brought 40 cents. There is not a large quantity of this latter quality of hair produced in this country, for the reason that the breeders have not given the matter proper attention. There is a great demand for the better hair, while the lower grades, which enter into the manufacture of carpets and horse blankets, find direct competition in wool.

While on the subject of prices, we will quote from a recent address by George G. Emery, of Sanford, Me.:

I have read where prices as high as 45 cents per pound have been paid this season for domestic mohair. Now, such statements should be followed by an explanation, otherwise false hopes are apt to be raised in the minds of the growers, which hopes, in my opinion, are not to be realized. I can take any bale from among the hundreds sent us yearly from the State of Oregon (and the same applies to the twelve months' growth Texas hair; in fact, in any State producing mohair to-day), and I can find mohair which is worth 45 cents per pound and even more, but the percentage of the low grades, worth from 18 cents to 20 cents, is so much greater and so far overbalances the fine as to bring the value as a lot to a much lower figure. I have seen some very choice domestic mohair, but the amount of such hair is very small when compared with the total production of the country.

Prices in the Cape of Good Hope have ranged about the same as in our own country.

The great mohair manufacturing center of the world is Bradford, England, and as it will be interesting to many to see the prices which mohair has brought in that city during a long series of years, the following table is prepared from data compiled from the Bradford Observer by the National Association of Wool Manufacturers:

Range of prices of mohair at Bradford, England, from 1856 to 1894.

	Cents.		Cents.		Cents.
1856	48 to 56	1869	86 to 88	1882	38 to 45
1857	56 to 66	1870	92 to 98	1883	40 to 43
1858	60 to 72	1871	78 to 84	1884	37 to 45
1859	72	1872	82 to 90	1885	28 to 36
1860	76	1873	72 to 80	1886	23 to 32
1861	76	1874	70 to 90	1887	25 to 29
1862	72 to 78	1875	82 to 92	1888	24 to 28
1863	80 to 88	1876	86	1889	25 to 42
1864	78	1877	60 to 70	1890	27 to 36
1865	70	1878	60 to 66	1891	24 to 28
1866	80	1879	36 to 54	1892	24 to 29
1867	66 to 90	1880	42 to 54	1893	24 to 37
1868	58 to 76	1881	38 to 42	1894	27 to 31

But what of prices in the future? This is the important question with the breeder, and it is one that is difficult to answer. It seems likely that there will be an increasing demand for mohair in the classes of goods which now consume it, to say nothing of the new uses that may be developed; hence it may be expected that the demand will be strong. On the other hand, there will doubtless be an increased production, which will have a tendency to lower the price. There are so many uses for mohair already established in the world that it is not believed that prices will ever fall to a level with wool. One prominent manufacturer of mohair goods expresses the opinion that the "average prices paid this year [1901] can be considered as a low-water mark." This was about 25 cents a pound, as stated above.

The American Wool and Cotton Reporter states that with an

HAND-PAINTED MOHAIR PLUSH.

increased production of Angora goats in this country, and the consequent enlarged production of mohair, the latter is going to be consumed more largely than heretofore, and is, indeed, already "cutting more of a figure in the wool market." The domestic product is favored by a tariff of 12 cents per pound on the imported article.

CARING FOR FLEECES.

It may not be known to goat breeders generally that the objection to any foreign fibers in mohair is the same as that which holds against kemp, namely, they will not take the mohair dyes. Therefore, if every particle of such foreign substance is not removed before going into the fabric, it shows in a prominent and unpleasant manner when the article is dyed, and necessarily cheapens it if it can not be burled out. For this reason mention is made here of the practice, quite general in this country, of tying fleeces with twine. In removing this twine at the mills it is almost impossible to prevent portions of it from adhering to the fleece, and it must be removed so far as possible by the most painstaking care. Fleeces from Turkey and Cape Colony are not tied, but simply rolled up inside out, and this is the condition in which the mills desire to receive them.

Goats should be washed before shearing, in the manner that sheep are washed, for much dirt will thus be removed, and the value of the fleece greatly enhanced. After the fleece is taken from the goat, it should be spread out upon a clean table, where all foreign substances may be carefully removed. While this procedure is tedious, and to some may appear useless, it will pay; for the work must be done on the farm or at the mill, and farm labor is not so expensive as mill labor.

MOHAIR MANUFACTURES.

The first striking feature of mohair manufactures is their great beauty. The luster of the hair, which is so pronounced even while it grows upon the goat, remains in the manufactured goods, and no amount of washing and no character of dye will remove it. It aids the dyes to show their colors more effectively, and imparts to the goods the pleasing property of changing shades in shifting lights, which is a feature quite characteristic of silk goods.

A second feature of importance is that the dyes are usually fast, and however much such goods may be exposed to the elements they will not fade. In the best mills fugitive dyes are not used except when an order is received to match a sample which has been treated with such dyes; for a fugitive dye can not be matched by a fast one, nor can a fast dye serve for a fugitive one.

The durability of mohair goods has been quite fully discussed in connection with the durability of the fiber composing them. It is a characteristic that ought to make their use economical in many ways.

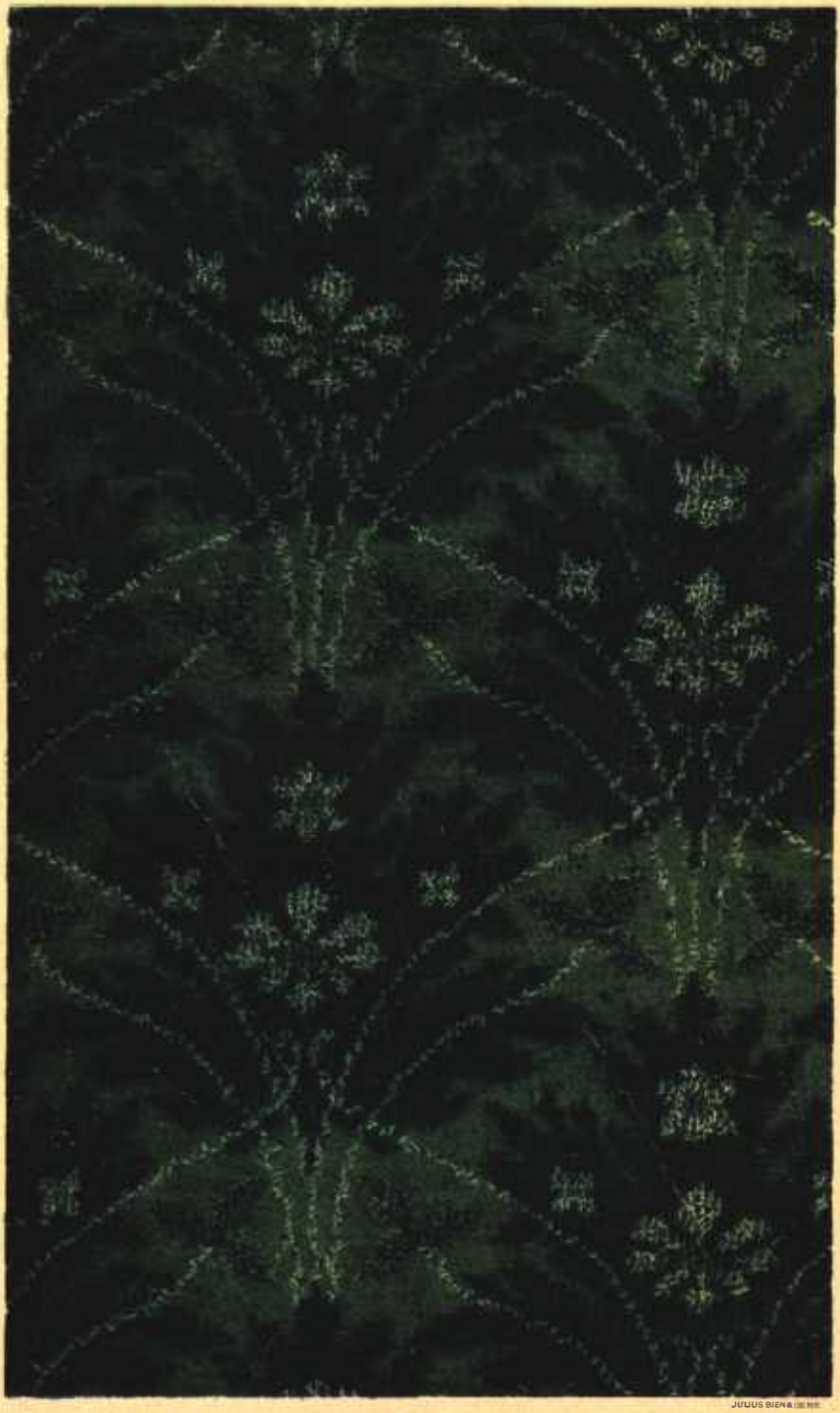
This should be the case especially with dress goods and other wearing apparel.

Mohair manufactures already have a very extensive use, but they appear in the stores under so many trade names that only a few people, comparatively, know that they are the product of the Angora fleece. These manufactures are so varied, and the fiber adapted to so many things which are now made of wool or cotton, that no attempt will be made here to give a complete list of them, but a recital of some of the principal uses of mohair goods will be made, in order that it may become generally known how extensive is their use at the present time, and some idea formed of the possibility of extending the use of mohair to other lines of manufacture.

By far the most important product of mohair manufacture is plushes. It is a fact not generally known that practically all of the plushes used in railroad passenger cars are made of mohair; so also are the plushes used in street cars. How much is used annually in the passenger cars of our country can only be conjectured. The report of the Interstate Commerce Commission for the fiscal year of 1899 shows that there was an increase of 244 cars over the previous year; let us add to this a number to take the place of those worn out, which probably can not be less than 200, thus giving a total of 444 new passenger coaches each year. Each coach requires at least 120 yards of plush, and the total quantity required for the 444 cars would be 53,280 yards. This is an underestimate rather than an overestimate. During the year mentioned there were in service in the United States 16,785 first-class passenger cars, 3,063 second-class cars, 4,206 combination cars, 464 parlor cars, and 488 sleeping cars—total 25,006. This means that there were in use that year 3,000,720 yards of plush. Add to this all that is used in street cars, omnibuses, etc., for which there is no basis for an estimate, and we may conclude that its use for such purposes is enormous.

Besides the car plushes, which are usually plain, large quantities of frieze and crush plushes are used in upholstering furniture. The designs for the frieze plushes are limited only by the ingenuity of man. The skill of the fabricator is so well developed that the threads forming the designs are in loops and of different color, yet the whole is woven at one time "in the white" and afterwards colored in the same dye. The crush plushes are very handsome, showing to best advantage the effects of varying lights upon solid colors. This kind is largely utilized in upholstering armchairs, but finds large use also in other kinds of furniture. (Pls. XXV and XXVI.)

The carriage robes, couch covers, sofa-pillow covers, and rugs are distinguished by their high pile and rich coloring. The pile upon the carriage robes and sofa-pillow covers is about half an inch high. The robes sometimes have the pile on one side only, but many are made



MOHAIR FRIEZE PLUSH.

with the pile on both sides. The coloring is most exquisite, as is true of the sofa-pillow covers and couch covers. These colors are printed on by hand after the pieces are woven, and are rendered indelible by long steaming. Rugs necessarily require more modest covering, but all the richness of subdued colors and luster remain to make them a distinctly beautiful as well as useful ornament. These goods have not long been upon the market, but they can hardly fail to attract attention and advance in favor.

Most of the so-called astrakhan now in use so extensively is made of mohair. It has all the beauty of the real article, is much more durable, will never change its shade in sunlight or air, and is in no manner inferior to real astrakhan.

This Bureau has been furnished with samples of plain mohair dress goods (brilliantines), as well as mohair crepons, which are common and well known for their durability. There is no other kind of cloth which is more easily cleaned or which retains its newness for a longer period. For this reason brilliantines are especially popular for traveling dresses. Mohair crepons are more beautiful, but also more expensive, costing from $1.25 to $5 a yard. The cheaper grades are woven upon a cotton base, and go to pieces sooner than when woven upon a wool base. In crepons there is sometimes an admixture of silk.

It would be very difficult to enumerate the many ways that mohair might be used in manufactures. Besides plushes, which form the principal item, there may be mentioned dress goods of various designs, coats and coat linings, table covers, knit mitts, mittens, gloves, etc., which are already on the market. It has been found that mohair cloth is the only kind that will stand the strain in the expressment of cotton-seed oil, and there is a growing demand for it for this purpose. A suggestion has recently been made that mohair could be manufactured into tent and sail cloth and rain coats, having as its qualifications durability, lightness in weight, and immunity from molding. Mohair cloth will not only turn water, but will hold water like a skin if the water is not beaten through it. A piece of brilliantine in the form of a bag and holding a glass full of water hung all day in this office and not a drop passed through it during that time. Mr. John S. Harris recently informed the writer that he possessed mohair cloth 40 years of age which would hold water in the same manner. Tent and sail cloths would necessarily be heavier, and be even more effective in turning water. It is argued that the extra cost of this kind of cloth for these purposes is more than compensated for in the matter of durability and lightness of weight.

SKINS OF ANGORA GOATS.

Ordinarily, one would not expect to find a discussion of Angora goat-skins under the general subject of mohair manufactures, but in consideration of many of the special uses to which the skins are put, because

of the mohair rather than the skin to which it is attached, it seems proper to discuss the matter here.

The skins of the Angoras, if taken when the hair is about 4 inches long, make very handsome rugs. The hair retains its original luster, and may be used in the natural white or dyed any color desired. The pure white ones are more generally preferred. There is a demand for Angora rugs in the United States which so far has not been supplied by domestic production. These rugs can be purchased at prices ranging from $4 to $8.

Another article of manufacture from the skins is the carriage robe, rivaling in beauty and durability the buffalo robe, which is no longer a factor in the market. They are not expensive when the demand for skins is considered, and may be purchased for about $20. The smaller skins of the does and wethers and the kid skins find an extensive use in baby carriages, and are exceedingly attractive in their brilliant white.

These skins are used largely in the manufacture of children's muffs and as trimmings for coats and capes. The finest kid fleeces adorn the collar and border of some of the ladies' most handsome opera cloaks. In the stores they are sold often under some peculiar name which does not inform the purchaser that they are ornamented with the hair of the Angora goat, and so thousands of such articles are worn by people who are unaware of the true name of their "furs."

There is a tariff of 12 cents a pound on mohair and a varying schedule applying to mohair goods, but skins having fleeces attached come in duty free. Importations are without doubt very large, but it is impossible to give the figures, as the Treasury Department does not keep the records of imports of Angora skins separate from skins of other goats. Our source of supply for these imports is Cape Colony.