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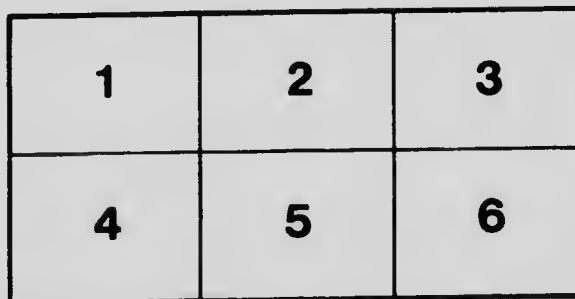
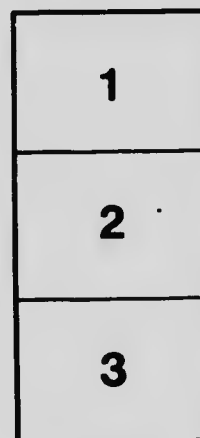
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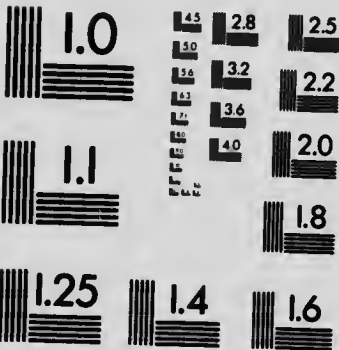
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Ontario Department of Agriculture

ONTARIO AGRICULTURAL COLLEGE

BULLETIN 274

SHEEP

By

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and

J. P. Sackville, B.S.A., Associate Professor of Animal Husbandry



At pasture.

TORONTO, ONTARIO, NOVEMBER, 1919



Ontario Department of Agriculture

ONTARIO AGRICULTURAL COLLEGE

SHEEP

Wade Toole and J. P. Sackville

While sheep raising has from the time of the earliest settlers been a more or less important industry in the province of Ontario, there has always been room for far greater numbers. Records show that the first pure-bred sheep came to this province in 1834 and there were then a considerable number of grades which had been brought in by the settlers. Sheep were among the first live stock brought to Canada, and there were nearly one thousand in what was known as French Canada at the end of the 17th century and at that time Nova Scotia had slightly over 1,000 head. Sheep breeding gradually progressed in the Dominion until 1871 when Canada had 3,155,509 sheep. After this the numbers gradually decreased, and in 1911 they had fallen off by almost 1,000,000, there being then 2,160,600 head. From 1901 to 1911 there were increases in the number of sheep in the Western Provinces amounting to 108,436 and decreases in the Eastern Provinces, including Ontario, of 441,375, or a net decrease in the Dominion of 335,939. The decrease in Ontario alone was 304,268 or 29.08 per cent.

The following table shows the trend of the sheep business in the various provinces of Canada from 1901 to 1911 as well as Ontario's relative position as a sheep-breeding province, as shown by the Dominion census, together with estimates by the Dominion Bureau of Statistics for 1918 and 1919.

NUMBER OF SHEEP, BY PROVINCES, 1901 AND 1911.

Provinces	Sheep		Increase (+) or Decrease (-)		Estimated by Do- minion Bureau of Statistics, June 15	
	1901 March 31st	1911 June 1	Amount	Per cent.	1918	1919
CANADA	2,510,239	2,174,300	-335,939	-13.38	3,052,748	3,421,958
British Columbia	33,350	39,272	+5,922	+17.76	45,291	44,985
Alberta	87,104	133,592	+46,488	+53.37	332,179	364,498
Saskatchewan	66,048	114,216	+48,168	+72.93	134,177	146,911
Manitoba	29,464	37,322	+7,858	+26.67	136,782	167,170
Ontario	1,046,456	742,188	-304,268	-29.08	972,341	1,101,740
Quebec	654,503	637,088	-17,415	-2.66	959,070	1,007,425
New Brunswick	182,524	158,316	-24,208	-15.26	140,015	212,745
Nova Scotia	285,244	221,074	-64,170	-22.50	259,847	261,529
Prince Edward Island	125,546	91,232	-34,314	-27.33	73,046	114,955

During the period of the Great War, owing to the enhanced prices for wool and mutton, and the need for greater production, the number of sheep increased in all provinces with the exception of Prince Edward Island, and in 1918 had reached 3,052,748 for the Dominion, while the number in Ontario was placed at 972,341.

Ontario has very close to one-third of the sheep and lambs of Canada, and about one-half million are sold or slaughtered off the farms of the province annually. While Ontario had 2,022,735 sheep in 1895, depressed market conditions, fear of losses from the ravages of dogs, and general lack of interest in sheep breeding caused the number to dwindle to the figure of 908,066 in 1916. With prices of wool, lamb and mutton high more interest has been taken in the farm flock and numbers have increased as is shown in the following table:

SHEEP AND LAMBS ON HAND IN ONTARIO ON JULY 1.

Statistics compiled by the Ontario Bureau of Industries showing the numbers of sheep and lambs on hand on July 1 of each year, whereas the Dominion census was taken on March 31 for 1901 and on June 1 for 1911.

Year	No.	Year	No.	Year	No.
1881	1,915,303	1895	2,022,735	1908	1,143,898
1883	1,868,784	1896	1,849,348	1909	1,130,667
1884	1,890,733	1897	1,690,350	1910	1,065,101
1885	1,755,605	1898	1,677,014	1911	1,040,245
1886	1,610,949	1899	1,772,604	1912	1,021,848
1887	1,396,161	1900	1,797,213	1913	996,155
1888	1,349,044	1901	1,761,799	1914	922,375
1889	1,344,180	1902	1,715,513	1915	908,095
1890	1,339,695	1903	1,642,627	1916	908,066
1891	1,693,751	1904	1,455,482	1917	956,986
1892	1,850,473	1905	1,324,153	*1918	972,341
1893	1,935,938	1906	1,304,809	*1919	1,101,740
1894	2,015,805	1907	1,106,083		

*On June 15th by Ontario Department of Agriculture in co-operation with the Dominion Bureau of Statistics.

These figures give some idea of the extent of the sheep industry in Ontario. While numbers dwindled for a time there has been a steady improvement in quality, and with better prices and more interest in this branch of the live-stock business numbers should still increase and quality continue to improve. Ontario has in the neighborhood of twenty-five million acres of assessed land with nearly fifteen million acres cleared. With under one million sheep there is less than one sheep for every twenty-five acres of assessed land and less than one to every fifteen acres of cleared land. When we consider that from six to seven sheep can be maintained on what is required to feed one cow there seems to be room for great developments in Ontario's sheep industry.

One of the greatest factors tending to improve the sheep breeding industry in the Province is the work in wool grading and co-operative selling that has been carried on by the Ontario Sheep Breeders Association with the aid of the Live Stock Branch of Ontario Department of Agriculture for the past three seasons. It speaks well for the success of this work that the amount sent to Guelph to be graded each year shows a substantial increase and the number of satisfied producers also continues to grow.

In 1917 the Association charged five cents per fleece for grading and selling the wool. In addition the grower paid freight to Guelph. At the close of the season's business 1 per cent. of the value of the wool was refunded to all shippers.

In 1918 the Association charged 1 cent per pound, and the Canadian Co-operative Wool Growers, Limited, through which the wool was sold, charged 1¼ cents per pound against the wool. Besides this a membership fee of 50 cents was charged for fifteen fleeces or less, and \$1 for more than fifteen fleeces. The grower also paid freight to Guelph.

In 1919 the Association charged 1 cent per pound, and the Canadian Co-operative Wool Growers, Limited, 2 cents per pound. Membership fees were the same as in the previous year, and freight to Guelph was paid by the grower. A refund of one-half of one per cent. of the value of the wool was made to all shippers.

The growth of the business of selling wool co-operatively in the Province is indicated by the following table showing amounts of the various grades handled in each of the three years in which the scheme has been followed:

Grade	Amount handled in 1917	Amount handled in 1918	Amount handled in 1919	Selling price per lb. in 1917	Selling price per lb. in 1918	Selling price per lb. in 1919
	lbs.	lbs.	lbs.	cts.	cts.	cts.
Fine Staple.....	....	740	....	....	75	....
Fine Medium Staple..	....	807	....	....	76	....
Medium Staple.....	....	281	....	....	73	....
Fine Combing.....	....	....	385	....	....	70
Fine Clothing.....	....	573	222	....	70	64
Fine Medium Combing	3,461	8,102	7,492	67	76½	67
Fine Medium Clothing	....	979	6,581	....	70	62
Medium Combing.....	82,241	129,518	204,519	66	76½	67
Medium Clothing.....	7,184½	24,678	18,173	67	73½	62
Low Medium Combing	64,636	228,281	256,620	63½	73½	60
Low Combing.....	....	169,297	96,429	....	67	52
Lustre Combing.....	4,480	....	....	57	....	....
Coarse	93,444	104,820	113,748	57	60½	45
<i>Rejects</i>						
Burly and Seedy)		15,812	13,338	} 50	} 42	} 40
Cotts	8,835	26,724	22,851			
Dead.....		5,197	4,615			
Gray and Black.....	1,851	4,401	3,823	46	41	40
Locks and Pieces	604	163	....	34	....	....
Washed Wool (fine) ..	....	} 7,766 }	3,848	} 78	} 95	} 82
Washed Wool (coarse)	....		2,790			
Tub Washed Wool.....	....	1,300	....	....	85	65
Tags	4,886	18,769	18,343	26	16½	35
Mohair.....	....	29	13	....	....	40
Sisal.....	....	....	1,388	....	....	52
Miscellaneous.....	....	....	138	....	....	....
Totals.....	271,122½	748,237	775,316			

CLASSIFICATION OF SHEEP.

With very few exceptions the sheep found on the farms in the Province of Ontario are maintained for the production of mutton, the wool, though of considerable importance, is looked upon as a secondary consideration. The various breeds belonging to this class although varying more or less in type, all possess general characteristics that stamp them as *mutton sheep*. A general classification of the breeds of mutton sheep is made according to fleece, the two classes being

commonly known as the *medium wool* breeds and the *coarse or long wool* breeds. The sheep belonging to the medium wool breeds possess somewhat finer and denser wool, while the color of the hair on the face and legs generally varies from a light to a dark brown. Together with good quality of wool, sheep of this class are recognized as possessing pronounced mutton form. The breeds belonging to this class are as follows: Shropshire, Southdown, Oxford Down, Hampshire, Suffolk, Dorset Horn and Cheviot. With the exception of the Dorset Horn and occasionally the Cheviot these breeds are all hornless.

The long or coarse wool breeds are characterized by having a much longer, coarser fleece, lacking as a rule the density found in the medium wool breeds. They are usually somewhat heavier and possibly a little more upstanding and most of the breeds belonging to this class have either white or mottled faces.



Mutton type.

The long or coarse wool class is represented by the following breeds: Leicester, Lincoln Cotswold and Romney Marsh. These are all hornless.

Characteristics of the Mutton Sheep. In conformation the mutton sheep approaches very closely that of the beef animal—low set, broad, deep and thick with straight, parallel lines and deeply and evenly fleshed. Fullness and rotundity of form, compactness and smoothness coupled with a stylish appearance should be emphasized.

Types of Wool Breeds. In addition to the mutton breeds already mentioned there is another type or class of sheep known as the *Fine Wool* class. They are bred practically altogether for their wool, which is of the finest quality and suitable for the manufacture of finest grades of cloth. To this class belong the *Merino* and *Rambouillet*. Having been selected for the production of wool, it is only natural to find that the mutton characteristics common to the other kinds are not found in

this particular class. They are fashioned more after the pear or wedge shape of the dairy cow; carrying less width and fleshing. The best specimens of this class have heavy folds or wrinkles over the neck and shoulder which permit of a greater surface of body, which lends itself to the production of a heavy fleece of wool. Merino and Rambouillet blood has been introduced to a more or less extent into the mutton flocks on the ranges as the instinct to band together in large numbers is a distinct advantage under such conditions and is natural to this particular class, and is not true of the mutton breeds.

THE SHROPSHIRE.

The native home of the Shropshire is in the counties of Shropshire and Stafford, England. The breed has been developed by the use of Southdown, Leicester and Cotswold blood on the native stock.

Characteristics. In general appearance the Shropshire conforms to what is recognized as excellent mutton type. It is somewhat heavier than the Southdown, rams weighing at maturity about 225 lbs. and ewes about 160 lbs. The head is



A trio of Shropshires.

covered with dense wool, which should completely cover the entire face excepting a small part of the nose. The legs are also well woolled. The color of head and legs is usually a dark brown, being considerably darker than those of the Southdown. There should be an absence of black wool on the head. The wool is reasonably compact, of good quality, medium fine, and should be free from black fibres. It is longer than the Southdown but shorter than the Oxford, being about three and one-half inches in length. The skin should be a bright pink.

As a breed the Shropshire has been very popular in Ontario. Like the Southdown they are very hardy and do well under climatic and feed conditions in this province. The ewes are fairly prolific and the quality of the mutton is good.

THE SOUTHDOWN.

This breed originated in Sussex County, Southeastern England. Southdowns, as we know them at the present time, are the result of improvement of the native stock of Sussex County. This improvement was brought about by selection and careful breeding, until to-day the breed ranks among the first as a mutton sheep.

Characteristics. They are the smallest of the down breeds, the mature ram weighing about 175 lbs., the ewe 135 lbs. The shortness of leg, compactness of form and general smoothness of outline give this breed an advantage as they weigh well for their appearance, and what they lack in size is made up, in part at least, by their excellent quality as the mutton of this breed has always held a premier place on the largest markets and with the most discriminating mutton consumers. A blocky, compact, well-rounded-out form is characteristic of the breed, and this, together with the fact that the present day demand is for a light lamb, is a reason for believing that this breed will grow in popularity in Ontario. The head is covered with a cap of wool which should not extend below the eyes. This, as with the wool covering the legs, is a greyish-brown or mouse color. The wool is of fine texture, should be dense all over the body, averaging possibly two and one-half inches in length. Associated with this the skin should be a bright cherry pink.



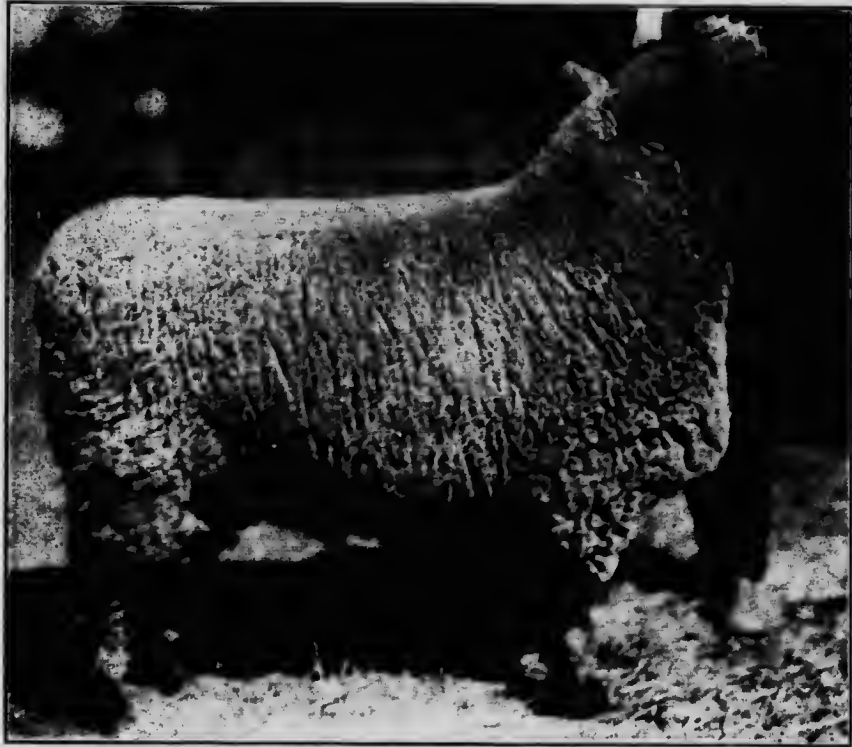
Southdown ram.

THE OXFORD DOWN.

As the name indicates this breed is a native of Oxford County, England, and the foundation was begun by a cross of a Cotswold ram with a Hampshire ewe. From the result of this cross followed by selection a fairly uniform breed of sheep was developed.

Characteristics. In some respects this breed resembles the Shropshire. They have, however, more scale, being the largest of the medium woolled breed. Rams weigh 275 lbs. when fully developed, and 200 lbs. is not uncommon for ewes. The wool covering of the head does not extend below the eyes nor is it as dense as with the Shropshire. The color of the head and legs is usually a uniform dark brown. The ear is inclined to be larger, the face longer, and the entire head lacks the

general refinement found in the Shropshire. The fleece is longer and coarser than the other down breeds, but withal is usually of good quality and the sheep shears a heavy satisfactory fleece.



Oxford ram.

THE HAMPSHIRE DOWN.

To the county of Hampshire, England, can be traced the foundation of this breed. The original stock differed considerably from Hampshires as we know them to-day. They were inferior sheep possessing horns and lacking in those characteristics that go to make a good mutton sheep. These animals were improved by the use of the blood of the Southdown, and out of this cross, together with rigid selection, developed the present-day Hampshire.

Characteristics. The Hampshire is the second largest of the medium woolled breeds being surpassed only by the Oxford. Mature rams should weigh around 250 lbs. and ewes 190 lbs. The head is woolled to a point just below the eyes and on the cheeks, the color of both head and legs being a dark brown bordering in some cases to black. The ear is long and droops somewhat, the head large and inclined to be rather Roman nosed.

As regards wool the Hampshire shears a fleece of medium length and quality, but lacks the quantity reasonably expected from sheep of their weight. As a mutton producer, however, the breed ranks high, the lambs mature early, their flesh is of excellent quality and they are looked upon with considerable favor where early lambs are required for the market.



Hampshire ram.



A group of Suffolks.

THE SUFFOLK DOWN.

Originating in the counties of Norfolk and Suffolk, England, this breed has been improved by the use of Southdown and Hampshire rams. The Southdown blood improved the breed in respect to quality and general mutton form, the Hampshire increasing the weight and scale.

Characteristics. The head is fairly long, distinctly black in color and the wool does not cover the head beyond a point behind the ears. The ears are rather large and the same color as the head and legs. In size the Suffolk ranks between the Shropshire and Hampshire, the rams weighing around 230 lbs. and the ewes about 180 lbs.

The Suffolk Down as a mutton sheep ranks high, the infusion of the Southdown blood giving it a high quality of flesh. As a feeder too, the Suffolk has given a good account of itself, the lambs making very satisfactory gains as compared with those of other breeds.

In regard to fleece this breed is only fair, the wool is of good quality, being reasonably fine, but the breed is said to be a comparatively light shearer.

THE DORSET HORN.

The counties of Dorset, Somerset and Wiltshire, of Central and Southern England, is the native home of this breed. The general improvement of the breed has been brought about by careful breeding and selection, with the result that the modern Dorset Horn differs considerably from the original stock.

Characteristics. The outstanding feature of this breed is that they are horned (both sexes), those on the male curving backwards and around spirally, while those on the ewe curve downwards and slightly forward. The face and legs are white; the same is true of the hoofs and nose. There is a cap of wool on the head which should not extend below the eyes. This breed does not always exhibit the fullness and compactness of form found in some other breeds of the medium wool class, but the best specimens of the breed conform fairly well to mutton type. In size the Dorset is about the same as the Shropshire, mature rams weighing around 225 lbs., the ewes about 165 lbs.

The chief claim for this breed is that they are well adapted for the production of early lambs, the ewes are said to breed at almost any time of the year, and it is not uncommon in some Dorset flocks for the ewes to raise two crops of lambs in one year. In addition to this they are fairly prolific. The quality of mutton, particularly with young fat lambs, is good, while that from older sheep is classed as fair.

THE CHEVIOT.

That section of country between England and Scotland, known as the Cheviot Hills, is claimed as the original home of this breed. They have been improved by crossing with Leicester, Merino and the Black-faced Highland.

Characteristics.—The head is free of wool, being covered with white hair. The face is inclined to show a Roman nose not unlike the Leicester. It is not uncommon to find horns in the rams. The Cheviot is medium in weight, the rams often reaching 225 lbs. or more, while the ewe will average 160 lbs. The fleece has been said to lack compactness, although within recent years more attention has been given to the question of density of the wool. In its native home the Cheviot is looked upon as an exceptionally good grazing sheep.



Group of Dorsets.



Cheviot ewe and ram.

THE LEICESTER.

This breed derives its name from the county of Leicester, England, where it has been bred since very early times. Much credit is due Robert Bakewell for the improvement of this breed. From a slow-maturing, hard-feeding, coarse, leggy sheep he developed a very superior animal showing excellent mutton qualities. This improvement was brought about by close breeding and careful selection. The breeders of long wool sheep owe much to the Leicester, as this breed has done a great deal in the improvement and development of practically all the sheep of the long wool type.



Leicester ram.

Characteristics. The general impression of the Leicester is that they are inclined to be long in the leg, the fact that their legs are absolutely bare of wool possibly tends to exaggerate this. They are comparatively broad in the back and carry out a full level rump. There is an entire absence of wool on the head, which is covered with short, fine, white hair, the skin often showing a slight bluish tint. A tendency towards a Roman nose is quite common in this breed. Black spots on the head, if not too large or too numerous, are not objectionable. The Leicester shears a real good fleece of long wool. This breed is possibly the smallest of the long wool breeds, rams weighing from 225 to 250 lbs., and the ewes as much as 200 lbs. This breed has a fairly wide distribution over the province, many of the grade flocks showing a predominance of the blood of the Leicester.

THE COTSWOLD.

This breed originated in the County of Gloucester, in Central South-western England. By the use of Leicester rams on the native stock both the quality of the mutton and wool was greatly improved.

Characteristics. The head of the Cotswold has a tendency to be Roman-nosed and is covered with wool that hangs in long ringlets from above the eye, spreading out over the face. The legs are also woolled to below the knees and hocks. The hair on the face and head may be either white or mottled with brown. The wool is comparatively coarse and long, and hangs in lock or ringlets over the body; the



Cotswold ram.

fleece is usually parted down the back, falling away on either side. This is a large breed, mature rams often reaching a weight of 275 lbs. and the ewes from 200 to 230 lbs. The Cotswold is a stylish sheep, possessing a bold, graceful carriage, and this with the characteristic wool covering of the breed gives it a very attractive appearance.

THE LINCOLN.

This breed has been bred for many years in Lincoln County, England. The native stock lacked many of the good features of the present-day Lincoln, being coarse and slow maturing. The infusion of Leicester blood did much to improve the mutton qualities and to bring the breed into prominence.

Characteristics. Like the Leicester and Cotswold, the Lincoln is inclined to have a Roman nose. The face is usually white, although may have brown spots. A small foretop of wool is found on the head and the wool on the body is com-



Five Lincoln shearling rams.

paratively long and coarse, hangs in ringlets, and is usually parted down the back. The Lincoln shears a very heavy flecce of wool. A weight of from 20 to 25 lbs. of unwashed wool has been known in case of mature rams.

In common with some others of the long wool breeds the Lincoln may be criticized for too great length of leg, but the back is broad and the rump level and full. The Lincoln is the largest of the long wool breeds, 300 lbs. being the standard weight for mature rams, and the ewes weigh close to 275 lbs.

THE ROMNEY MARSH OR KENT.

Although not widely distributed in Ontario, there have been a few flocks established within recent years. They are native of Kent County, England. This dis-



Kent or Romney Marsh ram.

trict is comparatively flat and moist, and this breed is said to give a good account of themselves under such conditions.

Characteristics. In general appearance this breed resembles the Lincoln, although lacking the extreme size of the Lincoln. The face is white and usually covered with a short cap of wool. They shear a good fleece of average weight. As already suggested, they are better adapted for grazing on low, flat land, than some of the other breeds, and they are reported as being comparatively free from many of the diseases that affect sheep.

THE CORRIEDALE.

Very little is known about this breed in America. They are of New Zealand origin, and were developed by the cross of a Lincoln ram on Merino ewes, the aim being to produce a sheep that would be suitable for range conditions, and at the same time would produce reasonably good mutton and wool. They are considered as being more or less of a general purpose sheep. The wool is a little longer than the Rambouillet, and is more dense and finer, while the lambs from the Corriedale ewes are said to weigh as much as 100 to 150 lbs. when six months old and good enough to top the London market.

The following description adopted by the American Corriedale Association describes the characteristics of this breed:—(a) Body large and symmetrical, general appearance to be bold and attractive. (b) Head bold and strong, well woolled down to the eyes, but not below, free from horns or scurs, with clear, white face free from any trace of black or brown hairs. (c) Neck strong, well set at the shoulders and free from any folds or conspicuous wrinkles. (d) Legs strong, set squarely under the sheep and well apart, also free from any trace of black or brown hairs.

THE RAMBOUILLET.

The Rambouillet is really of the same origin as the Merino, although developed in France on a large estate in the village of Rambouillet. The French Government did considerable work in an endeavor to improve the breed, with the result that the Rambouillet is larger, possesses more of the mutton form, and is said to be hardier and has a superior quality of fleece as compared with the stock originally brought over from Spain. The head is large, and in most cases the males have horns the same shape as the Merino; the ewes are hornless. The folds or wrinkles of the skin are common to this breed, although not being so marked as with the Merino. In fact the Rambouillet, as a breed, might be classed midway between the Merino and the recognized mutton breeds.

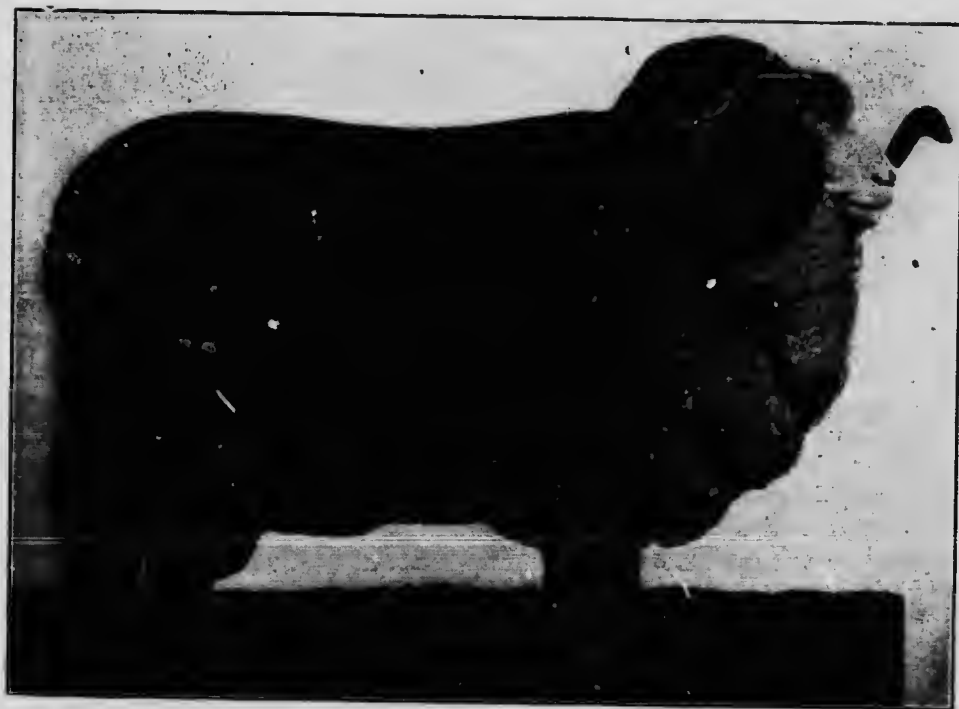
THE MERINO.

To this particular breed belong three classes differing somewhat in general type, but for our purpose it is not necessary to go into detail, the general characteristics of the breed as a whole being sufficient.

They are of Spanish origin, and as suggested previously the Merino has been bred for production of wool, and for this reason individuals of the breed differ considerably in type as compared with the mutton breeds. The fullness and rotundity of form is lacking, and instead of the fleshing found on other breeds a general, bare, muscular appearance is evident. On parts of the body, especially the neck and shoulders, are to be found folds or wrinkles in the skin, the number of these folds varying with the different classes.



Corriedale ram.



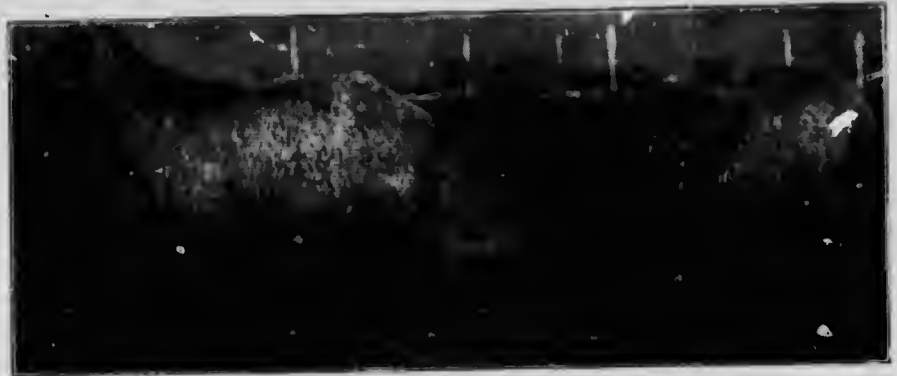
Rambouillet Merino ram.

The head is of medium size, and fairly well covered with wool. The rams possess horns, which are large and have considerable curl to them. The size of the Merino is not great, varying according to the different classes. The wool found on the Merino is of finest quality, the length and size of wool fibre varying with the different classes. In all classes, however, the wool should be dense, the fibre fine, the staple strong and the crimp close.

A special type of Merino has been developed in the United States called the Delaine Merino, a little larger and more compact in form than the other Merinos; a sort of dual-purpose breed, combining wool and mutton qualities.

THE KARAKULE SHEEP.

This class of sheep are maintained altogether for the production of the pelt, the lambs being slaughtered when only a few days old and the skins sold on the market as Persian lamb. Very satisfactory results have been attained by crossing the breed with long wool sheep such as the Lincoln, the offspring in most cases being black with a lustrous, tightly-curled fleece and a pelt which commands a compar-



Karakules.

atively high price. Very few flocks are found in Ontario. The business of breeding this particular class of sheep is at the present in the hands of a few men. As a matter of fact it is an industry that demands considerable skill and it is doubtful whether there will be any remarkable development in the business in this province.

The sheep are native of Bokhara, Central Asia, and were first introduced into America in 1908. In appearance Karakule sheep are long of body, medium in size and possess steep rumps, broad tails and long, drooping ears. The wool is long, coarse and hair-like on mature sheep and a light gray to brown in color.

SELECTION AND MATING.

The Ram. In order to make any progress in the development of live stock it is absolutely essential to maintain a good pure-bred sire for use on the herds and flocks. There is no more direct or economical method of improvement. An animal that has been bred and developed from good ancestors for a number of generations is bound to give better results as a sire than a scrub. There is possibly less ex-

case for the use of a grade ram than is the case with other classes of farm animals. The initial cost of a pure-bred is reasonable, the increase is rapid and the number in the flock comparatively large, which all means the returns from the use of a good ram in the flock are soon apparent. Not only should the ram be a pure-bred, but he should possess all the characteristics that are associated with a good sire, together with proper type and conformation. Unless a sire possesses abundance of vigor and vitality he will prove a disappointment as a breeder. A broad, short head, bright, full eye, large muzzle, thick neck, a deep, full chest, broad and deep in heart girth and a bold, stylish carriage all indicate an animal with plenty of strength and constitutional vigor. He should also conform to the true mutton type, being short and straight in leg supported on strong upright pasterns, full and deep in body, straight in his lines, long and level hindquarters with full, deep thighs. He should possess to a marked degree all the characteristics of the breed which he represents. The fleece, of course, will vary, depending upon the particular breed to which he belongs, but in all breeds it should show density and quality, together with sufficient length consistent with the breed in question. A clear, pink skin is an indication of health and quality and should not be overlooked. There should be no indication of horns or scurs on those breeds that are hornless. In selecting a ram many prefer to choose a twin, believing that the chances for double lambs will be greater than from a single ram.

Age to Breed. There is considerable difference of opinion regarding the age at which a ram should be brought into service. Where comparatively small flocks are maintained there is a tendency to use a ram lamb. Such a ram can be purchased cheaper, and on flocks ranging from half a dozen to twenty, they will give satisfactory results provided they are judiciously handled. On farms where twenty-five or more ewes are to be bred it would be advisable to secure the service of a mature ram. There is the added advantage of purchasing an older ram: the buyer knows exactly what he is getting, which is not always true when buying a lamb. In other words a promising lamb is sometimes disappointing as a mature ram.

Number of Ewes to Ram. Under ordinary conditions of mating, that is to say where hand coupling is not practised, a mature ram will care for a flock of from forty to fifty ewes. As already suggested about half of this number would be sufficient for a lamb approximately eight months old. With the ordinary flock of fifty ewes or less it will be necessary to arrange for a change of ram every two years to prevent too close breeding. Of course, where more than fifty ewes are maintained and more than one ram in service required, it will be possible to retain the sire in the flock for a longer period.

Feeding and Care of Ram. The aim should be to keep the ram in good vigorous condition at all times of the year. A short time before the breeding season commences a light feed of grain once per day might be advisable. During the time the ram is doing service, in the flock a fairly liberal supply of grain should be fed. A ration consisting of two parts oats and one part of bran gives good results. A mature ram can safely be fed from one to three pounds per day, the amount depending largely on the work the ram is doing. This, however, is a matter of the feeder's judgment. In order to retain the vitality of the ram and to get best results it is not wise to let him run with the flock continuously during the breeding season. A satisfactory plan is to allow the ram to run with the ewes during the day, shutting him away at night. In this way it is possible to give him two pounds of grain a day and in addition an opportunity is afforded for a rest. The question of mating is discussed more fully in another section. At the con-

clusion of the breeding season the ram may be allowed to run with the flock. The ration fed to the flock will usually suffice to maintain the ram in proper condition during the winter.

As the ewes approach lambing time it might be advisable to remove the ram from the ewe flock, which will avoid any danger of injuring the in-lamb ewe. When grass comes the ram may be turned to pasture with the flock until later in the summer, at which time it is well to separate him from the ewe, otherwise, as the cool nights in the fall approach, there is danger of the ewes breeding. During the fall, the ram may be allowed to pasture with the male lambs, or if that is not convenient give him the run of a grass paddock in company with some other member of the flock if possible.

The Ewe Flock. Where the object is the production of lamb and wool for the ordinary market a flock of grade ewes will give satisfactory results provided they are of the proper type, the flock culled carefully and mated to a good pure-bred ram. The ewes should show all the characteristics desirable in a mutton sheep, i.e., blockiness and fullness of form, strength and vigor, together with feminine character. The type of fleece already described in discussing the ram should also be looked for in the ewe flock. The importance of selection in order to maintain a high standard and to develop uniformity in the flock is a feature of sheep management that should be carefully observed. In order to cull the flock intelligently it is important that the owner have an intimate knowledge of every member of the flock. It may happen that some of the most useful ewes in the flock may be in thin condition due to nursing two husky lambs all summer; this being true, there is a danger of discarding a desirable ewe. A ewe sound in mouth and udder and a good breeder should be retained in the flock until her period of usefulness is past. However, there are usually a few members of the flock, i.e., those with broken mouths, defective udders, undesirable conformation or non-breeders that should be discarded and their places taken by a few of the choicest ewe lambs. Possibly the best time to do the culling is at the time the lambs are weaned. At that time the flock can be gone over carefully, and it is a favorable time to detect the ewes that have not proven their worth. At this particular time, too, the lamb flock is sufficiently developed, that the ewe lambs to be kept may be intelligently selected.

Fall Management of the Flock. After the lambs have been separated from the flock, the aim should be to prepare the ewes for the subsequent lamb crop. The drain on the ewes during the few months previous to weaning will usually result in the flock being in thin condition, and it is necessary that they receive good care so when the breeding season comes they are in good condition and gaining in flesh. It will be necessary to put the ewes on scant pasture a few days after weaning in order to check the milk flow and give them a chance to dry off. At the same time the flock should be watched carefully for a few days and milked out by hand. Unless this is attended to there is a possibility of udder trouble as it is usually the best producing ewes that require attention. The day after the lambs are weaned the flock should be assembled and each ewe should be milked out. Two days following they should be again gone over. At this time it will be found that some members of the flock will require no more attention; these may be marked with colored chalk. In about three or four days more those not marked will require a third milking out. With the exception of a few of the best milkers the flock will then be safe, but it may be necessary a few days later to again strip out a few of the heaviest milkers.

When the ewes are safely over the weaning process they should be moved to good, fresh pasture, and given an opportunity to regain the flesh lost during the period

of nursing the lamb. It is a fact that has long been recognized by sheepmen that ewes in good vigor or condition, when mated to the ram will give a much more satisfactory lamb crop than when bred in comparatively thin flesh. "Flushing" is the common term, and is simply conditioning the ewes preparatory for the breeding season. Ewes in such condition will give birth to strong, rugged lambs; there is a tendency for a larger percentage of twins and the ewes are more likely to conceive. Rape pasture has given excellent results for fall feeding of ewes. For best results the flock should have the run of a grass pasture in conjunction with the rape. Care should also be exercised in turning the flock on for the first few days, otherwise bloating may result. Very satisfactory results have been obtained at the Ontario Agricultural College with rape pasture for both ewes and lambs. There is something about the crop that adds tone and bloom to the flock. The 1919 lamb crop was one of the best on record and is largely attributed to the excellent condition of the ewes that were on rape pasture the previous fall. If it is not possible to provide rape pasture a very good substitute would be either fresh spring seeding or the second growth of clover, the aftermath of a hay field. Whatever pasture is used it should be of such a nature that the flock will be well nourished, and when the time comes to turn with the ram they are in real good flesh.

It is desirable that the flock should go into winter quarters free of ticks and lice. For this reason fall dipping should not be overlooked. This should be done before the weather becomes too cold. If possible choose a bright, sunshiny day, and if the work is done in the morning the flock will have time to dry off the same day.

Note. For further information on dipping see section on this subject.

Breeding. The lactation period for the ewe is approximately five months. The most favorable time for the young lambs to be born will depend largely upon such conditions as housing accommodation, feed supply, and when and how the lambs are to be marketed. In pure-bred flocks, especially where exhibiting is practised, it is often desirable to have the lambs come early in order that they may be well developed and show or sell to the best advantage. In such cases the ewes are bred to lamb in February and March.

On the other hand, where the object is to market the lambs in the ordinary way, it is usually better policy to have the lambs come later. Early in April is a pretty satisfactory time to have the lambs arrive. As a rule the weather is then comparatively mild and there is little risk of the youngsters becoming chilled, and they get off to a good start before going to grass. Some prefer to have the ewes lamb on grass as they claim there is less loss, it means little if any grain feed for the ewes, and the lambs go right ahead and make satisfactory growth. There is a little more difficulty in giving the detailed attention to the young lamb and its mother that is necessary while the flock is running out on grass, and it is doubtful if the lamb born later than early in April will reach, that year, the development of the one dropped at that time. However, as already suggested, it is a question that depends to a great extent on local conditions and one that can be left to the judgment of the flock-owner.

Before introducing the ram to the flock, the ewes should be gone over and all dirty wool and dung tags clipped from the hindquarters. This will give the ram a better opportunity to perform service and will result in fewer barren ewes.

In ordinary farm practice the ram may be turned with the flock during the day and taken away during the night. This is much more satisfactory, both for the ewe and ram than allowing them to remain together during the entire breeding season. It might be wise to go even further than this and allow the ram to mix with only part of the flock at a time. The object should be to conserve as far as possible the

vitality of the ram, and still make sure that the ewes are receiving attention at the proper time, and to accomplish this without undue time and labor. It sometimes occurs that the ram will have a preference for one or two ewes and will ignore others that require service. In such cases it may be necessary to remove a ewe from the ram after the first service and permit him to devote his attention to other members of the flock. When the ram is first turned with the ewes his breast may be painted with a soluble paint and the marking on the rump of the ewe will indicate those that have been bred. As each ewe is marked showing that she has been served she may be removed and the served ewes kept by themselves, thus permitting the ram to devote his full attention to those ewes that have not been bred. At the end of eighteen days, change the breast marking to another color and this will show those ewes that are taking the second service. In this way it is possible to keep a fairly accurate record of the service of each ewe and to note those that are coming the second time. Many sheep owners have had the misfortune to have in service a ram that did not get the ewes in lamb, this is particularly true in case of a lamb or a recently imported ram. When a number of the ewes are coming back for the second or third service it would look a little suspicious, and in such cases it would be wise to secure the service of another ram that had proven a sure getter.

FEEDS.

In discussing the various feeds used in a ration for sheep, the same factors which affect all live-stock rations must be considered. The animal must get sufficient carbohydrates to supply the fuel material for the body and the energy necessary to keep the vital organs active. It must also have plenty of protein to repair daily body waste, and mineral matter to replace the small, but continuous loss of this material from the body. It must also be remembered that, as a general thing, grinding, cracking or rolling does not materially increase the digestibility of the feed although it may aid in mastication. Soaking and wetting are not practised in sheep feeding very much and will not increase digestibility. Cooking of feed, generally speaking, is not advisable.

It should be remembered that the sheep is a ruminant, and has a digestive tract suited to the digestion of roughages, but that the sheep will not digest coarse roughage such as straw quite as well as will the ox, owing largely to the fact that the food is in a drier condition when passing through the intestines of the sheep than it is in the ox. In feeding sheep it is necessary to use, if possible, some legume roughage to supply protein cheaply and to supply the necessary amount of mineral matter. The clovers and other legumes are particularly rich in protein and mineral matter.

Common salt is essential to the life and health of the sheep. It serves as a spice to whet the appetite, and, while it does not affect the digestibility of feed fed, it stimulates digestion and prevents digestive disturbances. It is necessary to supply the hydrochloric acid of the gastric juice, one of the active juices of the stomach which is a big factor in digestion. Salt must be kept before the sheep at all times.

Water is also essential, and, while not considered a feed, it is a matter which the shepherd cannot neglect. Fresh, clean water should be available at all times. Especially is this true where sheep are being fed on dry feed and are nursing lambs.

Scientists have discovered that there are certain unappreciated factors, some-

times called vitamins, which are necessary to growth and general health in sheep as well as in other animals. These substances are present in such materials as the butter fat of milk, in egg fats, in the corn kernel, in the wheat germ, in the thin leaves of plants, and possibly in some vegetables. So long as the shepherd is feeding sufficient green feed or dried roughage the sheep should do well.

It is not possible to get good results from feeding concentrates alone to a ruminant animal such as a sheep, and growing lambs must have a considerable amount of roughage to properly develop them. They **must** also get an abundance of succulent feed such as pasture grass, silage and roots. These are beneficial because they stimulate digestion and are laxative in effect and economical in production. With this must go exercise, quietness and regularity. It must also be remembered in feeding sheep that production of wool is important, and a liberal supply of protein is necessary to ensure a good fleece. Good feeding makes far more and better wool.

In selecting feeds for the sheep care must be taken to get sufficient bulk in the ration along with the points already mentioned, and with it a maximum of palatability which is generally obtained by feeding a variety of feeds judiciously mixed.

. CONCENTRATES.

Corn. Corn is essentially a fattening feed. It is palatable, and may form the basis of the grain ration for fattening lambs, but will give better results if mixed with other concentrates such as oats or oats and bran. It may compose one-third to one-half the ration, or even more, and a good grain ration for a fattening lamb or sheep is from one pound to one and one-half pounds per day, according to age and size and other feeds fed. Of this amount corn might be used as previously stated. Corn should only be fed along with a protein-rich roughage such as clover hay or with a protein-rich concentrate such as bran.

Gluten Feed. Gluten feed is a corn by-product high in protein content and not very often used in sheep feeding. It may be fed to add protein in a fattening ration, but is not generally used.

Wheat. Wheat is not often used as a sheep feed owing to its value in the market. It has a tendency to become pasty, and to cause digestive disturbances. If used at all it should be mixed in small quantities with other concentrates such as oats and a little oil cake meal, or with some bran.

Wheat Bran. This is one of the best concentrates for growing lambs and for feeding nursing ewes. It has a beneficial laxative effect, and should be fed with feeds rich in lime such as clover hay. Mixed with oats or other grains up to a third or a half of the grain ration it is one of the most reliable feeds.

Wheat Middlings. Middlings are not generally used in sheep feeding, as bran is much better suited to the sheep.

Wheat Screenings. There is a product on the market known as wheat screenings which, with all the black seeds removed, is valuable in mixtures for fattening lambs.

Oats. Oats are the most extensively grown cereal in this country and one of the safest all-round feeds, particularly suited to sheep. Fed either whole or crushed they are palatable, and contain sufficient bulk to make them a desirable and reliable feed. In this country they form the basis of the concentrate rations fed, and are generally given at the rate of from one-half to one and one-quarter pounds per day per sheep. With them may be mixed bran and a little oil-cake or other concentrates as already suggested. They are a good carrier with which to mix other

feeds, and are relished by the young lamb and the old sheep alike. Mixed with a little bran or oil-cake meal they are an ideal concentrate ration for the breeding flock and for lambs during growth and fattening. From one-half to one pound per day is enough for the average breeding ewe and from one pound to one pound and a half for the average fattening lamb.

Oat hulls, oat dust, oat middlings and oat bran are not commonly used for sheep feeding.

Barley. Barley is not extensively used in sheep feeding. It is heating in nature and seems to interfere with digestion. It is not suitable for the breeding flock, but may be mixed with other concentrates as part of the ration in fattening lambs. When it is used legume hay should be fed with it.

Brewers' Grains. Dried brewers' grains are a rich protein feed bulky in nature which may be used in small quantities for sheep but are not a very satisfactory feed, and wet grains are not suitable for sheep feeding.

Malt Sprouts. This is a by-product of the malting process which is sometimes used for sheep in a mixture not exceeding one-half pound of the material daily. It is not generally considered a very good sheep feed.

Rye. Rye is a feed which is not very palatable and not considered a suitable sheep concentrate. It might be used in small quantity in a mixture of grains.

Millet Seed. Where it is produced in abundance, millet seed is sometimes ground and fed to stock. It may be used as a small part of the ration for fattening lambs.

Buckwheat. Buckwheat is not considered by shepherds to be valuable as a sheep feed.

Cottonseed Meal. Cottonseed meal has its limitations as a feed. It is more useful in milk production than for anything else. It must not be fed to very young animals, but is sometimes used in a grain mixture for older sheep. Preferably not more than from one-eighth to one-quarter pound of the meal should be fed daily and this mixed with other concentrates.

Linseed Meal. Linseed meal, also known as oil-cake meal, is very rich in protein, has a tonic and laxative effect, and is one of the best feeds available for obtaining rapid growth and high finish. It is often used for fattening lambs and putting sheep in condition for the show yard. About one-fifth of a pound per day mixed with oats or other concentrates is good feeding.

Peas. The Canadian field pea was formerly one of the most reliable crops grown on the Ontario farm. The grain, in small quantity, is an excellent feed. Mixed with oats and bran about one-third of each and fed from one-half pound up to one and one-half pounds per day of the mixture it is excellent for fattening purposes.

Beans. Field beans are generally used for human food. Sheep are about the only class of stock that will eat them readily unless cooked. About a pint per sheep twice per day is sufficient and the sheep seem to relish the beans and do well on them.

Tankage or Meat Meal. Tankage is a by-product of the packing houses and is generally used to supply protein, particularly for pigs. It is essentially a hog feed, but may be used up to ten per cent. in the meal ration of growing and fattening lambs where rapid growth is desired.

Molasses. Owing to the danger of smearing the wool molasses is not considered by sheep men as a very satisfactory feed.

ROUGHAGES.

Alfalfa. Of all the hay feeds, alfalfa, cut at the proper stage just as the new shoots are appearing in the axels of the lower leaves, is the best sheep feed. High in protein, palatable, and easily digestible, alfalfa with the leaves on the stalks can not be surpassed as a feed for sheep and lambs. When they are in good condition and getting a reasonable amount of roots and grain they will require from one and one-half up to two and one-half pounds per day, the smaller amount being fed when they are getting plenty of grain, but very little silage or roots. Silage or roots may replace a corresponding amount of dry matter in this roughage.

Red Clover. Although not so heavy a yielder as alfalfa, common red clover, because it will grow in almost any section of Ontario, is possibly the main hay ration for the sheep of the province. It is one of the best roughages for all classes of live-stock, and should be cut just before full bloom to be of most value. However, as it is rather difficult to cure at this stage it is generally left until about one-third of the heads have turned slightly brown. Like alfalfa, it is a good crop for soiling and should be fed much as alfalfa is fed.

Alsike. This hardy clover, generally sown in mixtures, is not as good a feed as red clover, but is much relished by sheep and makes satisfactory roughage. It is better mixed with red clover and some of the grasses.

Sweet Clover. Sweet clover is difficult to cure for hay, and is more suitable for pasture. It is liable to grow coarse, and if the weather is bad most of the leaves are lost in curing. There is considerable waste in feeding it to sheep. However, where well cured if the stalks are fine, it has a feeding value approaching alfalfa.

Pea and Oat Hay. This crop, cut when the oats are in the early milk stage, makes a satisfactory feed for sheep, almost equal to red clover.

Blue Grass. Early cut blue grass makes a very good winter feed especially if it has a little clover mixed through it.

While useful when clovers and other feeds are scarce such hay crops as timothy, red top and orchard grass are too woody, too low in protein, and too unpalatable to make high-class sheep feed. However, they may be used to good advantage when clover has failed.

Straw. Sheep which have to depend on straw for a living generally fail in condition. Wheat straw is quite unsuitable, barley straw is little better, and oat straw has some merit, but is not considered a suitable sheep feed. We are safe in saying that straw from the cereal grains does not make suitable sheep feed.

Pea Straw. In the days when peas were extensively grown and threshed with the flail, pea straw, provided the peas were pulled as soon as ripe and harvested without rain and afterwards flail-threshed, are almost equal to clover hay as a sheep roughage where roots were also available. Machine-threshed pea straw is not nearly as valuable, but the straw from legumes is relished by sheep and may be used to good advantage in their feeding, fed much as is clover hay.

Buckwheat Straw. Buckwheat straw is coarse and woody and although relished by stock is not considered to have very much feeding value. If fed at all it must be given carefully as there is danger of digestive troubles.

ROOTS, SILAGE AND OTHER FEEDS.

Corn Silage. Corn silage is quite commonly fed to sheep and if well preserved makes a fairly satisfactory succulent feed. It is not quite as valuable as swede turnips, but is eaten with a good deal of relish. Ewes may be fed from 2 to 4

pounds and lambs from 1½ to 3 pounds per day in conjunction with other feeds. Corn silage should not be fed as the sole roughage ration as the sheep are liable to go off feed. Mouldy silage must be avoided.

Swede Turnips. Swede turnips are one of the best succulent feeds for sheep and while they do not produce as much dry matter per acre as corn, may be grown by the Ontario sheep breeder to good advantage. They should not be fed heavily to in-lamb ewes as there is a danger of the lambs becoming large, weak and flabby. They are better pulped. About 3 pounds per day is a good ration for a fattening lamb. In-lamb ewes should not get quite as much, but after they have dropped their lambs they may be safely fed all they will eat.

Mangels. Mangels will yield a greater tonnage per acre than will swede turnips. They are quite suitable for fattening lambs but are not as much relished by sheep as are swedes. They should not be fed to breeding rams as they are liable to produce calculi in the urethra. They may be fed in the same quantity as swede turnips where used.

Soft, or White Turnips. This crop is generally grown for fall feed and is sometimes fed on the ground, being pastured off. The roots have not the same feeding value as swede turnips, but come in handy for fattening lambs or flushing ewes in the fall.

Cabbage. Cabbage is a valuable crop for sheep feeding. No class of stock relish cabbage more than do sheep and a small patch grown in rows from 30 inches to 3 feet apart and from 2 to 3 feet apart in the rows makes one of the finest soiling crops for fall feeding. It may be pastured, too, but is more satisfactory fed as a soiling crop.

Potatoes. Potatoes are generally considered too costly a feed to feed lambs. In a mixture they have been found about equal in value to mangels or sugar beets, but are not generally considered a satisfactory sheep feed.

Beet Pulp. Wet beet pulp, a by-product of the manufacture of sugar from beets, has about half the feeding value of roots and, close to sugar beet factories, has been fed extensively along with clover and alfalfa hay in fattening lambs. Where dried beet pulp is used it should be moistened with two or three times its weight with water. Beet pulp is not a very valuable feed for sheep in this country.

PASTURES.

For the general run of the flock a permanent pasture in which there is a good deal of blue grass is the most satisfactory for the summer. This, however, should be supplemented by second growth red clover or alfalfa giving the sheep and lambs a change as frequently as possible. Ideal conditions are those in which the sheep have access to a permanent blue grass pasture and at the same time have the run of a fresh plot of clover or alfalfa. It is necessary to change the flock from time to time from one pasture to another and some such crops, as the two clovers mentioned which will come on and give fresh green feed at several periods during the summer is invaluable. To further supplement this there is nothing which will excel rape. This may be sown in drills at the rate of 1½ pounds per acre and cultivated for a time or it may be sown broadcast at 4 or 5 pounds per acre. It is one of the best fall pastures upon which to turn weaned lambs or upon which to flush ewes.

Annual pastures composed of the spring grains are not very suitable for sheep pastures. The clovers, permanent blue grass pasture, and rape are the main standbys of the Ontario sheep breeder.

MANAGEMENT OF THE FLOCK.

Winter Management. The main feature in housing sheep during the winter is that their quarters should be dry, both overhead and underfoot, free from drafts, and well ventilated. Warm buildings are not necessary, but they must be protected from the storms. Provision should be made for abundance of exercise for the breeding flock. Possibly no other factor is more important to the success of the flock during the winter. In order to get a good strong crop of lambs the ewes must have plenty of exercise. A large yard located on the south side of the pen in which the sheep are allowed to run every day that is not stormy will usually afford sufficient exercise. It is not safe as a rule to allow the flock to run in the yard with other stock and for this reason they should have a yard of their own. Many successful sheep men consider the question of exercise of such importance that they arrange to feed their flock at some distance from the pen and in this way make sure that the ewes get sufficient exercise.

The aim should be to have the flock enter winter quarters in as thrifty condition as possible. On this will depend to a considerable extent the cost of maintaining the flock during the winter. Sheep that are carrying a reasonable amount of flesh and are clean of all ticks and lice can be carried through until near lambing time with very little, if any grain provided good quality roughage is available. On the other hand if the ewes are thin it will be necessary to feed considerable grain in order to put them in proper condition for the lambing season. It is much more economical to attain this condition in the autumn by means of good pasture such as rape or clover, than it is to attempt to do it later by grain feeding.

Feeding. As already suggested if the flock pasture in proper condition and are not due to lamb until late March or early April they can be maintained for the greater part of the winter on the cheaper, more bulky feeds. Legumes, such as alfalfa and clover hay or well cured pea straw, will prove very satisfactory. Of the three feeds mentioned possibly alfalfa is the best. However, on many Ontario farms this crop is not grown to any great extent and in such cases red clover will give good results. Well saved pea or bean straw is relished by sheep and fills in very well for a change. Even good quality oat straw may be fed in limited quantities. This may be scattered about the sheep yard and the flock allowed to pick through it during the day. This will provide a certain amount of exercise and that portion of the straw not eaten will serve as bedding and keep the yard clean. The hay is better fed in properly constructed racks. This will avoid waste and less tramping of the feed underfoot as sheep do not relish feed that has been once picked over. A full feed of either alfalfa or clover, night and morning, (all the sheep will clean up nicely) together with some oat straw scattered about the yard for them to pick through during the day should provide all the dry roughage necessary. Fine-stemmed, leafy hay is relished by sheep much more than coarse, fibrous or woody material, and when the hay crop is being stored provision should be made to reserve some of the best quality for the sheep. Second cutting of clover is preferred to that usually obtained from the first cutting, this being particularly true in the case of alfalfa. Timothy is an unsatisfactory hay for sheep; it is neither nourishing nor palatable, and if fed to any extent is likely to cause constipation. It has another disadvantage in that the seeds and coarse stems become incorporated into the wool which lowers the selling value of the fleece. If it can possibly be avoided timothy hay should not enter into the ration for sheep.

Succulent Feeds. The value of some succulent feed in the ration is appreciated by all good sheepmen. The chemical analysis of some of these feeds does not show them to be high in feeding value, as most of them contain a high percentage of water. However, the advantage of such feeds is that they have a toning effect on the animals, keeping their digestive systems in proper working order. In addition to this they enhance the feeding value of such feeds as the dry roughages, they are themselves very keenly relished and serve to add variety to the ration.

Of the various succulent feeds possibly roots are the most satisfactory; they are perfectly safe to feed in fairly large quantities and in addition they are keenly relished by sheep. At the Iowa Experimental Station one hundred pounds of roots fed to fattening lambs had a value of between 8 and 9 pounds of grain and approximately 18 pounds of hay, for breeding ewes they would give even a better showing. Of the three common kinds of roots fed on the farm—sugar beets, mangels and turnips—they would rank in actual food value in the order named. There is, however, a danger of feeding sugar beets and mangels to sheep as they tend to develop stone in the bladder in the case of rams or wethers. Turnips may be fed without injury to sheep of all kinds and offer a splendid succulent feed and so are preferred by many shepherds. The amount of roots to be fed will depend largely on the supply available, but the maximum would be about 5 pounds per day or one bushel for a flock of twelve sheep. Feeders generally feed about three pounds per day to ewes getting plenty of clover hay and a little grain. If fed in much larger quantities than this there is a tendency to make the ewes washy and the lambs born from ewes heavily fed on roots are apt to be weak and flabby at birth. Even one to two pounds of roots for each sheep per day will be very beneficial in adding the required succulency to the ration. Sheep are not able to handle whole roots as well as some other animals and they are better fed either pulped or sliced.

Corn silage has been fed to a considerable extent to sheep, and provided it is of good quality, it is an excellent substitute for roots. Silage made from fairly well-matured corn and free from mold or decay may be fed in reasonable quantities and where roots are not available it is the next best succulent feed. Unless the silage is of good quality it should not be fed, as the digestive system of the sheep is easily upset and scours, colic and general digestive disturbances will follow the feeding of inferior silage. As a rule sheep may be fed from two to five pounds of silage a day depending upon the quality of the other roughage being fed.

Amount of Grain to Feed. The aim should be to carry the breeding flock through the winter in a thrifty condition, making as much use as possible of the cheaper, more bulky, succulent feeds. It is not good policy, however, to allow the ewes to become too thin, and it may be necessary to feed some grain in order to maintain them in proper condition. If the fall pasture has been short, or the roughage of poor quality, and the ewes are due to lamb fairly early, a light feed of grain will be beneficial. The amount will depend on the condition of the flock. For ewes that are in fair condition, but require a little toning up one-half pound of grain each per day should be sufficient, in cases where the flock is thin and the aim is to put on flesh, it might be necessary to feed as much as two to two and one-half pounds. A light feed of grain commencing a couple of weeks before lambing, will tend to stimulate the mother's milk flow and build her up generally for the trying period during and after lambing, and it is advisable even if the ewes are in good condition to feed a light ration of grain at this time. If roots

or silage is being fed liberally it might be wise to feed a little lighter on the succulent feeds and substitute a little grain. There is no better grain feed for sheep than oats; containing a fairly high percentage of hulls they are a safe feed and in addition they are palatable. Mixed at the rate of two to three parts with one part of bran they make a highly satisfactory feed for sheep at any time. A quarter pound of linseed oil meal may be added to the grain ration a few days before lambing. It will tend to keep the bowels free and open and can be used to advantage.

Summer Management. The flock should be turned to pasture just as soon as the grass has got a fair start. It is often possible to make use of otherwise waste land such as the lanes and fence corners early in the spring before the regular pasture is available. The change from dry winter feeding to pastures should not be too sudden. Allow the flock to run out for a few hours for the first few days, housing them during the night, this allows for a feed of hay and grain twice a day. As the grass becomes more abundant and nourishing, the inside feeding may be gradually lessened until the flock can safely be maintained on pasture alone.

For the regular summer pasture it is desirable that sheep should be kept on land that is comparatively high and dry. Much of the trouble, such as internal parasites, foot rot and nodular disease is caused by pasturing sheep on flat, low land. It is a noticeable fact that the flock will always seek the high land pasture when it can be had. All classes of farm animals do better with a frequent change of pasture, and this is possibly of more importance in the case of sheep than with some other live stock. Here again many of the ailments commonly met with in sheep raising can be greatly lessened by not allowing them to run too long on any one field. On those farms on which there is considerable waste land that is located high and dry, the question of summer pasture is not a serious one. Sheep, of all classes of animals, will possibly give the most satisfactory return from such areas. This, supplemented later in the season by some pasture such as rape, will carry the flock through the summer and fall quite satisfactorily. However, on those farms that are practically all tillable, some provision should be made for suitable pasture for the flock.

An arrangement that has proven very satisfactory is to set aside a portion of the farm that is particularly suitable for sheep and by means of temporary fences provide for a few small fields or paddocks. These various fields may then be sown at different times and a continuous supply of pasture is always at hand. One strip may be sown to rye in late summer which will provide late fall and early spring pasture. After the rye has been eaten off in the spring it may be resown with rape which will come along for mid-summer feeding. A mixture of peas and oats seeded with red clover will give a picking through June and the clover will have sufficient growth in the fall to carry the flock for a few weeks. Another field could be put down to a permanent pasture which will always be available between times when the others are not ready. A patch or two of rape could be sown any time during the summer and always makes an acceptable sheep pasture. Where it is not practicable to plan for a succession of crops such as has been outlined, the ordinary pasture may be utilized keeping in mind that a change is desirable and should be provided if at all possible. Cattle and horses, especially the latter, are liable to cause injury to the flock and for this reason sheep will do better with a field to themselves rather than running with other stock unless the range is a fairly large one.

The hot, dry time during the summer is a trying season on the flock and whatever system of pasturage is followed some provision should be made for a supply

of fresh pasture at this time. In most seasons the aftermath of the hay fields or the fresh spring seeding may be depended on to furnish this and if available will fit in very well. Rape has always been looked upon as an excellent pasture and a field coming on at this time will serve to maintain the flock in splendid condition over this critical period. It usually takes from six weeks to two months from time of sowing until the crop is ready for use. It should be sown on well-prepared, mellow soil and can be sown in drills the same as turnips at the rate of one and a half to two pounds of seed per acre and the rows cultivated the same as with a root crop. No thinning is necessary. It is frequently sown broadcast at the rate of four to five pounds to the acre and, provided the land is clean, will come along well. It will be necessary to exercise a little care and judgment when first putting the flock on fresh rape pasture to avoid bloating. The sheep should be turned on for a few hours during the middle of the day, when the leaves are dry. The following day they may be left a little longer and the time each day lengthened until at the end of a few days it will be safe to give them the full run. Better results will be obtained from this crop when the flock has a run of a grass field in conjunction with it rather than when forced to pasture on the rape alone.

Feeding Grain to Lambs on Pasture. There is a difference of opinion regarding the need of feeding grain to lambs on grass while running with their mothers. It is true that in case of pure-bred flocks where the lambs are to be exhibited or sold for breeding purposes and the object is to push them along as fast as possible grain feeding is profitable. Under ordinary farm conditions, when the lambs are to be marketed in the fall or early winter as mutton lambs and especially when grain is high in price, there is a question whether or not it is profitable to do much grain feeding. The experience at the College farm is that lambs on good grass will eat very little grain. By arranging for a frequent change on to good fresh rape or grass pasture the lambs will make good growth and it is more economical than depending too much on grain feeding. In cases where the pasture becomes very short and dry, lambs, no doubt, will make good use of a light grain ration. Whether or not it is profitable to feed grain while on grass will depend on such factors as the price of grain, the condition of the pasture and the time of year the lambs are to be marketed. This is a question that can be left to the judgment of the owner. The aim should be to keep the lambs growing every day throughout the growing period, but, as has already been suggested, this is possible by providing plenty of the right kind of pasture.

Weaning the Lambs. As a rule lambs are better taken off the ewes when between four and five months old. By that time the ewes will not have a great deal of milk and it is better for both the lambs and ewes that they be separated. The breeding flock will have an opportunity to gain up in flesh and if the lambs are put on good pasture they will make better gains. If it is possible the separation should be made on a cool day and if they can be put at different ends of the farm it will prevent a good deal of fretting and worrying. It is not advisable to put them together again but to make the first separation final.

A rape pasture with a grass field adjoining makes an ideal pasture for the lambs after weaning. If this is not available second growth fresh clover or fresh spring seeding that has made good growth will make a good substitute. In the case of pure-bred flocks where the male lambs have been kept for breeding purposes it will be necessary to separate them from the ewe lambs.

Marketing Lambs. It is a recognized fact that no class of animals are put on the market in such an unfinished condition as lambs. Not a few lambs are sold at, or shortly after, weaning time before they have had an opportunity of putting on

much flesh. Lambs that are maintained on good pasture for some time after weaning will usually be in nice condition to go to market. A feed of from one to two pounds of grain a day to each lamb will do much towards putting on a good finish and unless the pasture is exceptionally good and the lambs in good flesh to commence with grain feeding might be profitably practised. A mixture of equal parts oats and barley (ground) with a little bran added is a satisfactory grain ration for finishing lambs. Where corn is available it can be substituted for the barley.

The bulk of the lamb crop in Ontario is marketed in the fall—October and November. This being true there is usually more or less of a glut in the market at this particular season, and unless the lambs are fairly well finished there is likely to be some discount in the price. Possibly, one season with another, as good returns are obtained by marketing at this time as any. In case the fall market is not satisfactory, the lambs not any too well finished, with grass plentiful and grain reasonable in price it might warrant holding the lambs over until later, say December or even January. At this time lamb is a comparatively scarce commodity on the market, and if offered in prime condition a satisfactory price is likely to be obtained. It is quite possible that for those farmers situated near a good local market the lambs can be disposed of to good advantage quite early in the summer. Many butchers in the towns and cities are anxious to secure a few choice lambs for their trade, and in such cases the lambs can be sold for as good a price or a little better price than later. No hard and fast rule can be set down as to the most favorable time to market the lambs, the market outlook and the feed situation will determine to a considerable extent the time when the most profit will be realized.

THE LAMBING SEASON.

Provided the flock has been properly handled during the winter, the success or failure of the lamb crop will now depend largely on the detailed attention given during this critical period. It is absolutely necessary for the attendant to be on hand frequently both day and night. The loss of not a few lambs, and in some cases both mother and lambs, can be avoided by prompt action on the part of the one in charge. A week or two before the ewes are due to lamb all the dung locks and dirty, straggling wool on the hindquarters of the sheep should be cut away with the ordinary sheep shears. It will be necessary to handle them carefully at this time otherwise considerable injury might result to the heavy in-lamb ewe. The removal of this superfluous wool will mean that the young lamb will be able to nurse with less difficulty, it will lessen the danger of wool balls in the stomach of the nursing lamb, and the ewe will be much cleaner at lambing time. The ewe about to lamb can be properly cared for to much better advantage when separated from the main flock. Provision should be made for a few small pens on the warmest side of the sheep house for this purpose. A very satisfactory arrangement is to construct temporary gates which may be set up when needed. Any ordinary rough lumber may be used, making the gates 6 feet long by 4 feet high, hinge two of these together and set the first one up in the corner fastening them to the wall with hook and staple. This makes a pen 6 feet square. These may be set up in a row along one side or around the main pen as required. By having four or five of these temporary pens on hand they may be used year after year and are always available when needed.

Under ordinary conditions and in case of normal delivery it is not necessary or wise to interfere with the ewe at the time of parturition. There are cases, however, where the lambs are very large, the passage of the ewe too narrow or the lambs coming in the wrong position, and in such cases the ewe may have difficulty in delivering her lamb. The attendant should always be on hand and ready to give any assistance in such cases. The experienced flock master will know when his help is required, but it is good policy to make reasonably certain that the ewe cannot lamb without some help before taking any action. When the ewe has been straining for some considerable time without any relief, it is a fairly good sign that the case requires investigation. Cleanliness and gentle treatment are two important things to keep in mind at this particular time. The hand and arm of the attendant should be first washed adding a little disinfectant such as carbolic acid or one of the coal tar dips to the water, then smeared with vaseline or linseed oil, and the hand gently inserted into the vagina. The object should be to ascertain whether or not the lamb is coming in the proper position, that is head and front feet first. If the presentations appear normal then it is a question of aiding delivery by gently pulling on the front feet of the lamb. At such times the inside passage of the ewe should be well lubricated with linseed oil which tends to soften the vagina and allow it to stretch. Unless the case is a very severe one it will usually yield to the treatment. Under conditions where the lamb is not coming in the proper position, then the case is a much more difficult one to handle. The lamb may be coming front feet first with the head turned back, or again the hind end may come first, in any case it will be necessary to correct the position of the lamb; it requires considerable patience and very gentle handling to do this in order to prevent injury to both lamb and mother. When the lamb has been put in the right position, the ewe may be able to deliver it herself, but if weak and unable to do so help may be given. A lump of pure hog's lard inserted into the womb of the ewe after difficult parturition will be very beneficial in healing it in case it has been injured in any way. If she is weak and exhausted give a stimulant to revive her. If the case has been a severe one it might be advisable to flush the ewe for two or three days by means of a rubber tube attached to a funnel using some coal tar disinfectant or boracic acid in warm water.

The Young Lamb. Lambs that are born strong will be on their feet and nursing in a short time, and provided the mother has a sufficient supply of milk they are well on the way to a good start. On the other hand weak lambs will require immediate attention. Lambs may be born that at first sight appear lifeless: these may often be revived by prompt action on the part of the attendant. First remove all phlegm from the mouth and nostrils of the lamb, then open its mouth and blow into it to start lung action. Next lay it on its belly and slap it gently on the body just over the heart. Repeat this action several times and unless the lamb is very far gone it will soon show signs of life.

Chilled Lambs. Chilled lambs may be warmed by immersing several times in a bucket containing warm water then drying thoroughly by rubbing with a woollen cloth. Another method is to place the lamb in a box or large basket together with a jug of hot water covered with a cloth then cover the whole with a blanket. A few drops of stimulant in a little warm water administered to the lamb will often have the desired effect.

In case of weak or chilled lambs the aim should be to get it nursing as soon as possible as nothing seems to revive them quicker than the warm milk from the mother. If the lamb is sufficiently strong it may be possible to accomplish this by holding it up to nurse. If too weak for this a little of the mother's milk should

be given from a spoon. Once the lamb is strong enough to stand up and suck the greatest difficulty is over. It is well to keep a close watch of both lamb and ewe for the first few days to make sure the lamb is getting a regular supply of milk. This can usually be determined by the condition of the young lamb, as a plump rounded-out appearance is a pretty good indication that it is getting all that is necessary. On the other hand the youngsters may not be able to take all the mother's milk and this will very soon result in a caked, inflamed condition of the udder. This is particularly true in the case of single lambs. They may nurse from one side only and the other half of the udder will give trouble. It may be necessary to hand milk the ewe for a few days until the lambs are able to take it all. For caked udder there is no better treatment than bathing well with hot water, dry thoroughly and apply warm, melted hog's lard. Care should be taken that the young lamb gets the first milk from the mother, this is necessary as the first milk is quite laxative and prevents constipation in the very young lamb. In case of constipation from one-half to a teaspoonful of castor oil will usually avoid any further trouble.

Ewe Disowning Lambs. It not infrequently happens that a ewe may refuse to mother her lamb, or in case of twins she may disown one. This is particularly the case with young ewes with their first lambs. The ewe should be confined in a small pen or tied so she cannot move about and if the lamb is real strong they will often get an opportunity to nurse. In other cases it may be necessary to hold the ewe several times a day to allow the lamb to nurse. With a little time and patience the mother instinct will usually prevail, and she will give little future trouble. A dog tied in or near the pen is claimed by some to give good results in persuading the mother to own her lambs.

Ewes Adopting Lambs. In the case of a ewe having only a single lamb and it dies, it is often desirable to have her raise another belonging to a ewe with two lambs especially if the motherless ewe has a liberal supply of milk and the mother of the other lambs is not raising her pair any too well. This can be accomplished by taking the skin off the dead lamb and placing it over the lamb that is to be adopted. Another method is to smear some of the milk of the foster mother over the lamb she is to take. At the same time it will be necessary to keep the ewe with her adopted lamb in a small enclosure for a few days until she becomes satisfied to own her new charge. It is also advisable to hold the ewe for a few times each day to make sure the lamb is nursing.

Raising the Orphan Lamb. In attempting to raise a lamb on the bottle the aim should be to follow the natural method as far as possible. Ewe's milk is comparatively high in butter fat, running on an average between 8 and 9 per cent., as compared with from 3 to 5 in the case of cow's milk. This being true the milk used for rearing young lambs should be from a cow testing high in fat, and for the first few weeks the same cow's milk should be used at every feed. Regular feeding every three or four hours, both day and night, and a little at a time, from two to three tablespoonsful, is absolutely necessary for best results. The addition of a little brown sugar to the milk has a beneficial, laxative effect. After three or four weeks when the lamb's digestive system has become accustomed to the milk the amount may be increased and the length of time between feeds lengthened until at a month or six weeks a few feeds a day will be sufficient. At no time should the lamb get an overdose of milk, just what it will take each time with a relish. The temperature of the milk is important and during the early stages should not vary above or below 92 degrees Fahrenheit. An ordinary sized bottle with a rubber nipple attached is the most satisfactory method of feeding and care should be

taken to keep both bottle and nipple scrupulously clean at all times. Over-feeding, the use of dirty bottle and nipple and feeding at the wrong temperature is the cause of much of the difficulty met with in hand raising lambs. The various troubles and ailments usually met with in young lambs are discussed in another section so it will not be necessary to mention them at this time.

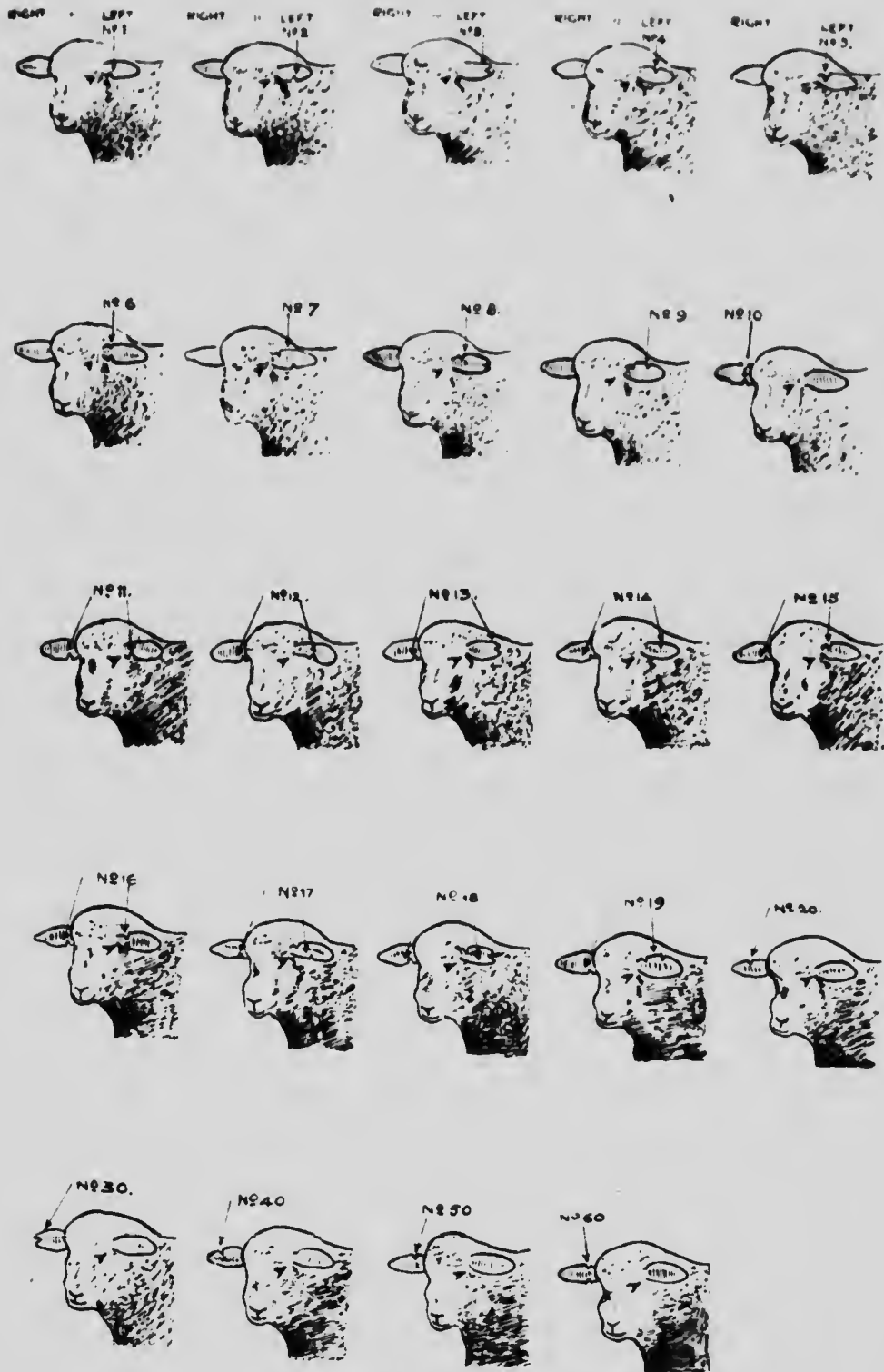
Feeding and Management of the Flock after Lambing. In order to avoid undue trouble and to carry the ewe safely over this trying period immediately following lambing she should be fed carefully for a few days. Good quality hay and a few roots together with a light feed of bran should answer very well. The grain ration may be gradually increased until the mother is receiving her full allowance. A mixture of two to three parts of oats to one of bran fed in conjunction with hay and either roots or silage should maintain a good flow of milk for the young lambs. A little linseed oil meal added will aid in stimulating the milk flow.

Feeding the Young Lambs. It is during the early stages of the young animal's life that it makes the most economical gains; every advantage should be taken of this fact and the feeding and general conditions should be such that rapid growth is possible. By the time the lambs are three or four weeks old they will commence to eat a little grain. Provision should be made for a pen into which the lambs may be fed separate from the ewe. This may be arranged by setting up hurdles in one part of the main pen and the openings into the smaller pen being the proper size so the lambs may enter and yet too small for the sheep to pass through. The same grain mixture suggested for the ewes is quite satisfactory for the lambs. The addition of $\frac{1}{4}$ to $\frac{1}{2}$ pound of linseed oil meal to the ration of two parts oats and one part of bran will improve it. Fine-stemmed, second cutting of alfalfa or clover hay together with a few roots, will be relished by the lambs and fed along with the grain will mean much in their growth and development. Care should be taken to feed no more than the lambs will clean up and the feed troughs should be kept clean. A little at a time and frequent feeding will give best results.

Ear Marking Lambs. In case of pure-bred flocks it is absolutely necessary to have some system of ear marking the young lambs. The ear labels cannot be put in until the lambs are a few months old, in fact it is advisable to wait until weaning time, the ear is usually strong enough at that time to bear the weight of the tag without drooping. Unless some method of marking is followed it is often difficult to identify the lambs and to keep the breeding records correct. Even in grade flocks it is well worth while to know what each member of the flock is doing as a breeder as this affords a basis upon which to make an intelligent selection.

There are several different systems of marking the lambs, the one outlined here has been used at the Ontario Agricultural College for a number of years and has proven quite satisfactory. A few days after the lambs are born a notch is cut into the ear with a punch, each mark representing a number, in case of twin lambs the same ear mark will do for both. At the time the ear is notched a record is made indicating that a lamb with a certain ear mark belongs to a ewe whose identity is known by the number on her ear label. Later on when the ear labels are to be inserted no difficulty is met with in identifying the lambs in the flock.

This system outlined requires little explanation, commencing with the left ear on the lower outside a notch here is No. 1, half way up the same side is No. 2, a notch on the top of the ear is No. 3, half way down the inside No. 4 and the lower mark in the inside No. 5. Still using the left ear No. 1 and 5 is No. 6 and so on up to 9. No. 10 is indicated by a notch on the outside lower part of the



A satisfactory system of ear marking lambs.

right ear. By using both the right and left ear it runs up to 20. For example 15 would be the lower notch on the outside of the right ear which is 10, this together with the lower mark on the inside of the left ear which is 5, making in all 15. A notch on half way up on the outside of the right ear is 20, corresponding with 2 on the outside of the left ear and so on up to 50. In this way the numbers can be used up to 60, which will be sufficient for any ordinary sized flocks especially as one mark will do for two lambs in case of twins.

Castrating. The importance of docking the lambs and castrating all male lambs not intended for breeding purposes is being appreciated more and more each year. However, a visit to any of the larger market centres in the autumn will reveal the fact that there is still considerable neglect in this regard. Very few farmers would consider marketing their hogs and beef animals entire, and yet on these same farms no thought is given to castrating the lambs. Not only are buck lambs discounted in price, but they will not settle down and feed as contentedly



Proper method of castrating.

as wethers. When the lambs are from ten days to two weeks old is the best time to perform this operation. They are then strong enough to withstand the slight shock, and there will be less danger and suffering than if left later. Collect the lambs to be castrated in a pen by themselves which is well bedded and clean. The operator should make sure that his hands and the castrating knife are clean. The use of a few drops of carbolic acid or other disinfectant in the water is a safe precaution. The lower end of the scrotum should be cut off which will expose the testicles. These should then be drawn out one at a time with the entire cord attached. The cord should not be cut off, but drawn out. The testicle of the young lamb is soft and pulpy and some difficulty may be experienced in pulling the testicle and cord with the fingers. Pinchers may be had which will perform the operation in a satisfactory manner. Another common method is for the operator to grasp the testicle with his teeth, in this way the cord can be drawn out without

any danger of breaking. Those who have followed this method for some time are agreed that it is the safest and most satisfactory of any. It is well to apply some disinfectant after the operation. It will hasten healing and prevent any bad effects from dirt getting into the cut.

Docking. This is a comparatively simple operation and should never be overlooked. A bunch of lambs that have been docked present a much more attractive, uniform appearance than those left with their tails on. There is less trouble with dung locks and dirty wool collecting on their hindquarters when the tails have been removed. Later on in the season when the weather is very warm and the grass wet there is danger of lambs becoming infested with maggots in the region of the tail, due to the collection of dirty wool. This is greatly minimized when the tails have been removed. The ewe lambs may be docked any time after they



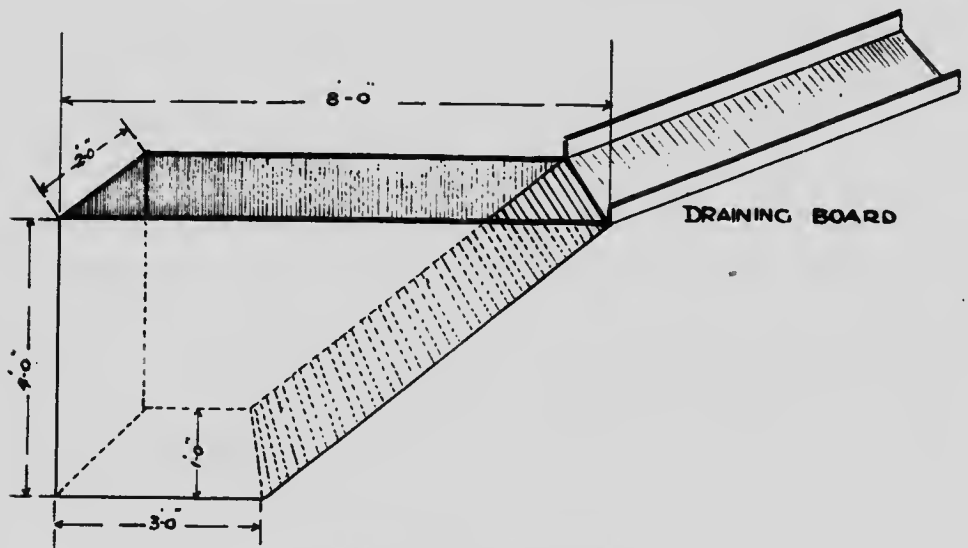
Docking properly done.

are a week old, provided they are strong and nursing well. The shock will not be so severe if done while the lambs are quite young, and any time from one to two weeks after birth is best. In the case of male lambs that have been castrated, it is safer to wait for a week or ten days before docking. The tails may be removed by means of a sharp knife. First find a joint about one and a half inches from the body, then shove the loose skin covering the tail up towards the body so when the tail is removed this loose skin comes down and covers the stub. Now place the knife on the under side of the tail where it is to be removed and with the other hand holding the loose end, the tail can be severed making a clean cut. Special pinchers may be had which, when heated, will remove the tail. These pinchers are quite blunt and the operation is one of searing the tail off rather than cutting. There is probably less danger of bleeding by this method and many prefer the pinchers rather than the knife. In case of severe bleeding following the use of the knife a string tied tightly around the butt of the tail will prevent any great

loss of blood. The docking should be done on a comparatively cool morning; there is less danger of bleeding when it is cool, and in addition the lambs may be watched for several hours afterwards, which is not so likely to be done if performed in the evening. It is well to keep in mind that cleanliness in the matter of docking is important, and some good disinfectant applied to the wound will be beneficial. If the docking is done later, when the flies are liable to cause trouble, there is nothing better than ordinary pine tar for this purpose.

DIPPING.

In order to keep the flock in a healthy, vigorous condition throughout the year it is important that they should be kept free from ticks and lice. A good quality of wool cannot be obtained from an infested flock and no amount of feed will make up for the ravages of these pests. After the sheep have been shorn in the spring



Suggestion for a dipping tank.

there is little protection left for the ticks and they will then infest the lambs. A few days after shearing the sheep the young lambs should be dipped. This is absolutely essential if rapid growth and development is to be expected. If a regular dipping vat is not available any ordinary receptacle that is large enough, such as a tub or half barrel will answer very well. Spring dipping of the ewe flock although not as important as fall dipping is advisable and in most cases it is worth while. When the wool has been removed it will take comparatively little dip to do the flock and the increase in the value of the wool and the general thrift of the flock will ordinarily warrant the time and expense.

Before the flock enter winter quarters in the fall they should all receive a thorough dipping. A bright, warm day in October should be chosen and the dipping done in the morning so the wool will have time to dry before night. It is safe to say that fall dipping of the flock should never be neglected. Even in those flocks that are supposed to be clean, it will pay. In case any sheep are to be added

to the flock they should always be dipped before being taken in with those that are already clean.

There are several different brands of sheep dip on the market any one of which will give satisfactory results provided directions are carefully followed. The water to be used for dipping should be warmed, and the mixture should be stirred frequently to prevent the heavier dip settling to the bottom. The sheep should remain in the dip for approximately two minutes to allow the wool and skin to become thoroughly saturated.

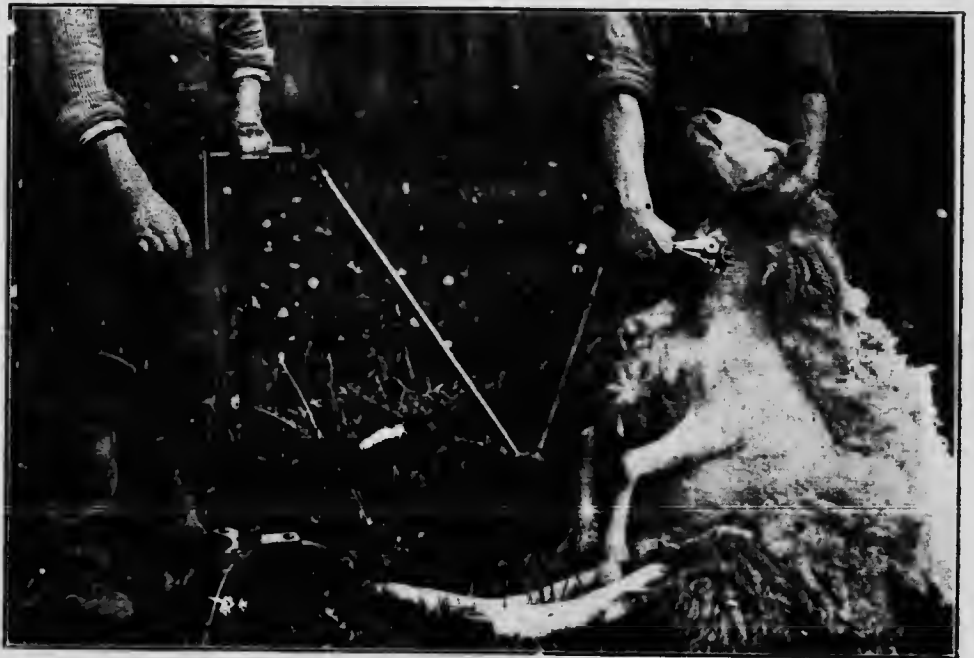
Unless the flock is a very large one it will not be necessary to build an expensive dipping tank. A large trough or barrel might answer if nothing else is at hand. However, a very satisfactory tank may be built of ordinary tongued and grooved matched lumber. Ordinary lumber may be used and have the inside lined with galvanized iron. Strong galvanized iron alone properly constructed by a tinsmith will make a good vat, although possibly rather expensive. Where comparatively large flocks are to be handled, it might pay to construct a cement vat set part way in the ground with a system of gates and a small pen to handle the flock entering the vat. Whatever tank is used it should be set in the ground so the top of the tank will be about two feet above the ground surface. The size of the tank will depend largely on the number of sheep to be dipped, but for ordinary use the following dimensions will be found fairly suitable: 8 feet long on top, 3 feet at the bottom, (the difference in the width between the bottom and top being due to one end having a slope on which cleats are fastened to allow the sheep to walk out of the vat): a width of 2 feet on top sloping to 1 foot at the bottom and a depth of 4 feet. Provision should be made for a draining platform at the end where the sheep are taken out. This should slope towards the vat and holding the sheep here for a short time after coming out will mean a great saving in the amount of dipping material necessary.

SHEARING.

The difference in price between washed and unwashed wool is in favor of the latter. Comparatively little washed wool has been offered on the market during the past ten years, and it is now generally agreed that there is nothing to be gained by washing sheep. Shearing should be done in the spring just as soon as the weather will permit: the old idea of leaving the fleece on until the middle of June is not good flock husbandry. There are several advantages in shearing early: the work is accomplished before the rush of spring and summer work commences, it is a good deal more comfortable for the sheep than leaving it until the warmer weather, this is especially true if the ticks are plentiful and the general health and thrift of the flock will be increased by relieving them of their winter protection just as soon as it is safe. In most districts in Ontario shearing may safely be done early in April. This will depend somewhat, of course, on the time the ewes are to lamb. It is an advantage to shear, if possible, before they lamb as it lessens to a considerable extent the danger from wool balls in the stomach of the young lamb. If the shearing can be done within two weeks of the time the lambs are expected, it will be perfectly safe. If this is impossible it should be done as soon after as it is practicable. For any one owning a reasonable sized flock a sheep shearing machine is a profitable investment. In fact arrangements could be made for a few farmers in one district to buy a machine co-operatively and the expense would not be heavy on any one. Machine shearing is easier on the operator and the sheep, and much cleaner, neater work can be done with them as compared with the ordinary



Hand shearing.



Machine shearing

hand work. The ordinary hand shears in the hands of an experienced man will do a good job, it is true, and if there are only a few sheep in the flock it might not warrant buying a machine. In removing the fleece the aim should be to keep it clean, to prevent the fleece from being torn apart, avoid cutting the sheep, and to make the operation as easy as possible for both shearer and sheep.

The shearing can be done on a clean barn floor or outside on a grass plot. The use of a horse blanket or clean sheet will prevent the wool from becoming dirty and will make it easier for both the sheep and the operator. To commence with, the sheep should be set on its rump and the wool on the neck removed first by separating it on the under side; follow this up by opening the fleece down the belly and shear part way round on both sides of the under side of the body. The sheep may then be turned on one side, the operator holding it by placing one knee on each side of the neck. In this position the upper side may be shorn, then turn over on the opposite side and that portion of the fleece still remaining can be finished. Care should be taken to keep the sheep from struggling and kicking so



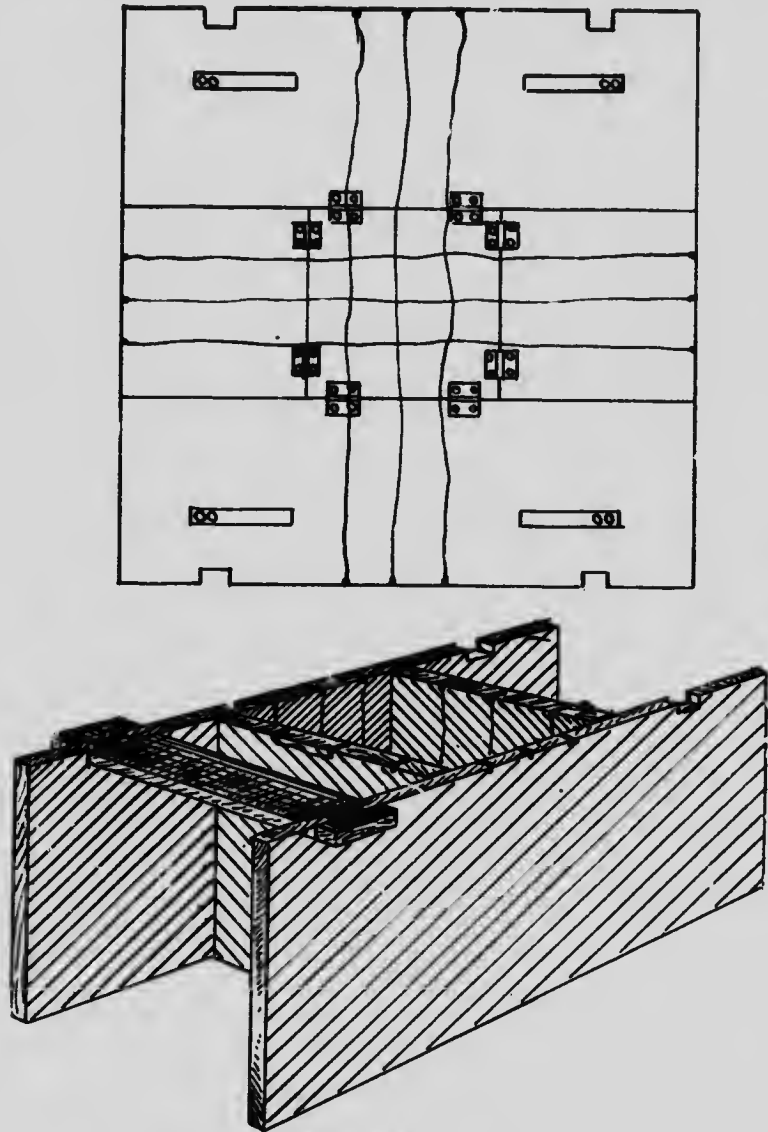
A fleece properly tied.

that the fleece may not be torn apart. Some shearers make a practice of tying the legs of the sheep. This may be advisable if the sheep is very restless, but it is much easier on the animal if the legs are not tied, and under ordinary conditions it is not necessary.

Tying the Fleece. When the fleece has been removed it should be spread out on the blanket with the clipped side down. All dung locks and dirty wool should be cut off and sold separately from the main fleece. To tie the fleece, both outside edges should be folded in leaving a width of about a foot and a half. In this position roll from both ends towards the middle into a compact, neat bundle. The old practice of tying the fleece by twisting the neck piece into a rope should not be followed. That portion of the fleece that has been twisted for this purpose is injured to a considerable extent when the wool is opened up for manufacture. The use of ordinary binder twine is also objectionable as the strands of twine become incorporated into the wool. Such wool cannot be used for making a high class fabric. Paper twine is now available for tying the fleece and is the only string that

should be used. If the wool is not marketed immediately it should be stored in a dry place, otherwise considerable damage may result from the effects of dampness.

The use of a wool-box will aid considerably in making a compact, tidy bundle of the fleece. This wool-box is constructed as follows: take three pieces of inch, planed lumber each one foot wide and three feet long; the centre board is cut into



Plan of a wool box.

three pieces each one foot long, by means of eight hinges the five pieces are now fastened together in such a manner as to form a box, that is the centre of the middle board will form the bottom of the box, the two end pieces of this same middle board will go to provide the ends and the two outside boards will be the sides. When the box is set up the two end pieces are held in place by means of a sheet iron spring attached to the side pieces. Two slats dovetailed and arranged so

they may be removed each time the box is set up will hold the two side pieces up in their place. To tie the fleece the box is opened up flat and the twine is put in place, being held by cutting three notches on each side, twelve in all. Spread the fleece with the shorn side down, fold in the edges and then bring the sides and ends together to form the box. When fastened the fleece may be tied securely with the string. Now open up the box and the result will be a firm, tidy bundle. A little more time is required to do up the fleece with the wool-box, and in spite of the fact that it does make a much neater fleece many farmers will be content with putting it up by rolling as previously suggested.

TRIMMING THE FEET.

During the winter when the flock is confined to the pens their feet will require trimming to keep them in good condition. Weak pasterns and some of the com-



Before and after trimming.

moner diseases of the feet may be prevented by a little attention in regard to trimming. A strong sharp pocket knife may be used for this or clippers made for the purpose may be purchased. Not only do the toes grow out very long but the sole of the hoof will turn under, both should be pared giving the hoof the proper shape. At the same time all accumulation of dirt should be removed. The paring may be done much easier after the sheep have been running out in the wet grass or snow for some time, as this tends to soften the brittle hoof.

Salt and Water. During the winter when the snow is available and especially where a liberal supply of roots is being fed, the flock will not suffer a great deal if no water is given. At the same time they will drink more or less water if it is to be had, and if at all convenient it will pay to provide it even in the winter. After the ewes have lambed in the spring and during the summer, while on grass,

an abundant supply of clean, fresh water should be at hand. Especially during the long, hot days of summer the sheep will drink a liberal supply and the health and comfort of the flock demands that it be available.

Salt should be before the flock at all times during the year. A box or trough, set up in the pen during the winter or in the field while on pasture, in which there is always a supply, will assure the owner that his flock is always well provided with salt.



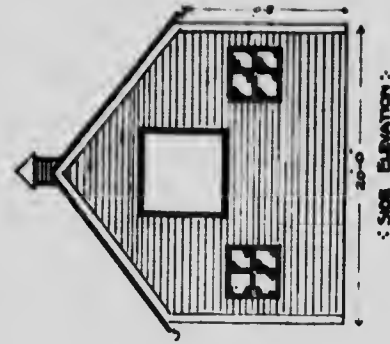
Clippers used for trimming feet.

SHEEP SHEDS, BARNs AND FEED RACKS.

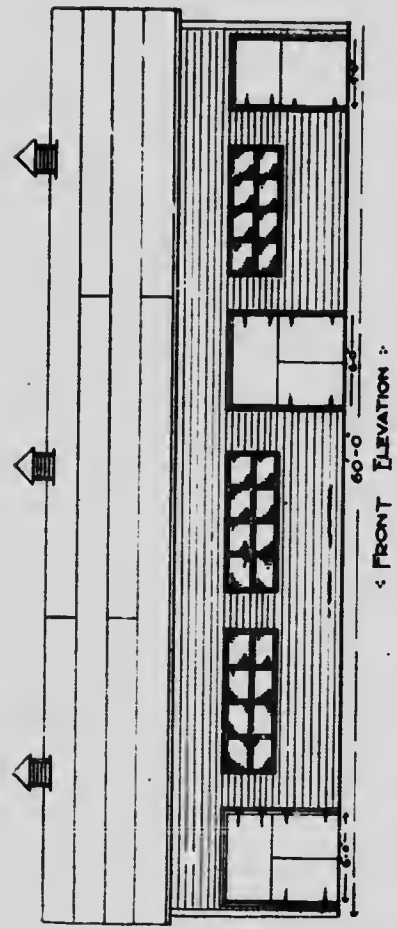
The first thing to consider in the matter of sheep barns is their location. Sheep do better on rather high, dry ground and under no consideration should the buildings be placed anywhere but in a dry, airy place. In Ontario, housing is necessary through the inclement weather of late fall and winter, but buildings should always be placed so that the sheep may get a maximum amount of outdoor exercise, and there should be provision for large outside yards, preferably to the south of the buildings, to which the sheep may have free access on all fine days.

Sheep barns or sheep pens need not be expensive structures. The main points to keep in mind are: good ventilation, which should be accomplished without drafts; plenty of floor space for each sheep; an abundance of sunlight; good drainage; and every convenience in respect to storing of feeds and the handling of the flock. The builder should be careful to plan his building large enough. Crowding is often disastrous. While the smaller breeds will get along with from 12 to 14 square feet per sheep, the larger breeds require up to 18 square feet, and this is not too much space for the man who is planning a sheep barn or sheep pen to allow for each sheep in his flock.

As previously stated the building does not require to be elaborate in design or construction. For foundation walls cement or stone will answer the purpose. Of course, the wall should go below the frost line to solid ground and extend just above the ground. Cement is a little cheaper than stone to construct and is quite as suitable. The barn does not require to be warm, with the exception of that portion which is used as a lambing pen. The building may be studded up and boarded on the inside and outside, the outside having the cracks battened or drop siding used and the inside should be of matched lumber, making a good dead air space and a dry, satisfactory wall. In one corner of the barn should be built a warm extra-lined, lambing pen.

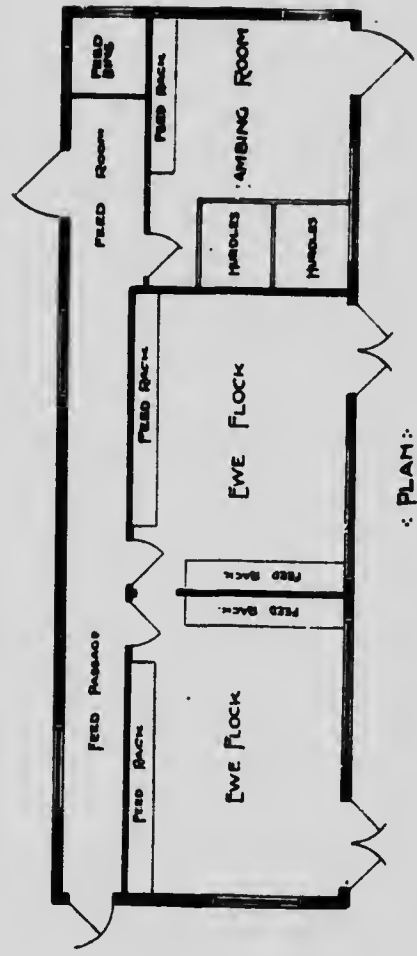


← SIDE ELEVATION →



← FRONT ELEVATION →

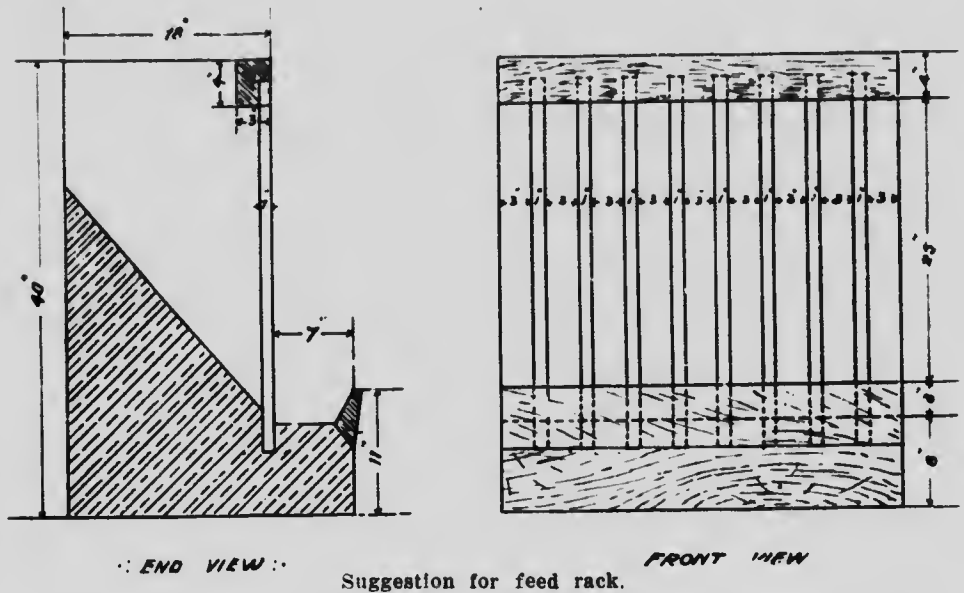
SUGGESTION FOR
A SHEEP BARN



← PLAN →

For partitions it is well to have on hand a number of hurdles which may be used to construct small pens as required, but for the main partitions movable feed racks, such as illustrated, are quite suitable, save space and are altogether desirable. These placed back to back allow the sheep to feed on both sides or they may be used placed against the wall if desired. A trough kept well supplied with clean, fresh water should be provided in each pen.

In planning the building, the shepherd should make provision by which he can keep his ewe and run lambs in separate pens, and these, of course, separated from the older breeding ewes. In large flocks it is also necessary to plan a pen for older rams. In the breeding ewe pen it is well to provide a number of small hurdles, leaving space about 6 feet square for individual ewes at lambing time. These, of course, are temporary and only require to be used while the lambs are young.



Suggestion for feed rack.

All doors should be built fairly wide to avoid the sheep crowding when going in and out. From 6 to 7 feet is a good width. Large windows, hinged at the bottom and opening in from the top are desirable. Doors are best split in the centre so that either the top or the bottom half may be opened as desired.

To provide for ventilation the Rutherford system or a modification of this system is quite satisfactory. By extending up the outside of the wall a tube of cement or plank about 9 by 18 inches and bringing this down through the wall at the floor and protecting it on the inside by a sheet iron deflector to prevent drafts fresh air inlets may be provided for. These outside boxes should go down into the ground. Then, for outlets, ventilators through the roof coming down through the left and into the sheep pen at the ceiling are necessary. The outlets should provide double the surface of the inlets and should be built of two-ply tongued and grooved lumber. They may be regulated by a damper.

It is a wise precaution to have plenty of loft room overhead for the storage of hay and feed and to arrange for a root cellar, which may be built under the barn approach with cement walls and with a cement top held together by reinforcing of

wire and some such material as old railroad rails. The building should also be provided with bins for grain and a suitable feed room. The accompanying illustrations will give the reader an idea of the type of feed racks and troughs recommended and also of a suitable barn and shed for the handling of a fair sized flock of sheep.

The building, as described, may be too elaborate for some. If so a very satisfactory structure for all purposes with the exception of supplying sufficient protection just at lambing time may be put up of ordinary lumber, one-ply with the cracks battened. The sheep at the Ontario Agricultural College do very well in such a building, and with care at lambing time this type of barn answers all right. It would be well to use lumber planed on one side at least that it may be painted.

DISEASES.

As with all other classes of live stock disease prevention is far more successful than is a cure after any trouble, contagious or non-infectious, gains a foothold in the flock. A sick sheep is not easy to cure, yet with good care many sheep diseases yield to treatment. The best policy, however, is to feed regularly on wholesome feed of the best quality; give plenty of pure drinking water; keep salt before the flock at all times; avoid drafts and hot, ill-ventilated quarters; keep free of ticks and lice; do not crowd; keep dry; and change pastures and runs frequently. These attended to, coupled with the weeding out of old and sickly ewes and the use of a strong, vigorous ram should keep the flock fairly healthy. However, with all known precautions taken some disease is sure to creep into the flock from time to time and it is well to understand a few symptoms and treatments.

Footrot. Footrot is a more or less common contagious or non-contagious disease which requires care and very often rather heroic treatment to eradicate. Low, wet pasture, dirty pens and yards and neglect in trimming feet may bring on the non-contagious type. The contagious form is rarely found in Canadian flocks. Sometimes in new importations a few cases develop.

Lameuess, slight at first, gradually becomes more pronounced and sores or cracks are seen between the digits. The cracks later exude pus.

Keep the sheep in a clean, dry place. All hoofs should be examined and pared when necessary to remove any superfluous hoof-growth. Diseased hoofs should be severely pared down until the bottom of the trouble is reached and the feet soaked in a solution of 1 ounce of copper sulphate to 2½ pints water. Isolate diseased sheep. Some shepherds grind the copper sulphate to a fine powder and fill the sores or cracks with the fine powder, forcing it in with the back of a knife blade or some such instrument. We have seen bad cases yield to a treatment of butter of antimony carefully worked into the cracks or sores after severe paring. The shepherd must be careful not to get this material on his hands or on the flesh of the sheep. The writer has seen practically the whole hoof cut away down to the quick and then the butter of antimony applied and the sheep recover after practically growing a new hoof. The attendant must get right to the bottom of the trouble with his paring knife else treatment will be without results.

Grub in Head. This is a large grub which is found in the sinuses of the head of a sheep in whose nostrils the sheep gadfly (*oestrus ovis*) has laid its eggs the previous summer. These eggs hatch in the nostrils and the larvae crawl up and deposit themselves in the sinusses, developing into large grubs.

Not all sheep which have grub in the head show clinical symptoms. The worst sufferers, however, fail in flesh, become weak and thin, and may show giddiness and loss of appetite.

The shepherd should plan to prevent the trouble rather than have to cure it. Sheep should have their noses smeared with pine tar during the months of July, August and September when the fly is most likely to attack them. If time is not available to catch each sheep separately and smear their noses, put tar on the edge of the salt trough or put salt in two-inch nuger holes in a log in the pasture and smear the edges of these with tar. Sheep always run to a dusty place with their heads low when the fly attacks. Stirring up the dirt drives off the fly so a plot of plowed ground is a help in the sheep pasture. Trephining the sinuses may be practised to get rid of the grub once lodged in the head. We have heard also of shepherds using turpentine in the nostrils to cause violent sneezing which may dislodge the grub. Prevention is better than cure.

Goitre. Sheep of all ages are subject to this disease and in some seasons heavy losses in the lamb crop occur. It appears as an enlargement of the thyroid gland beneath the throat. It is believed to be hereditary or may be caused by some form of mal-nutrition. In-breeding should be avoided, plenty of exercise given and breeding only from sound, healthy, well-nourished stock practised. Curative treatment avails little.

Sturdy or Gid. Sturdy, Gid or Turnsick is caused by a species of tapeworm which infests dogs, and in a certain stage of its life history becomes encysted in the brain of the sheep. The disease is most common in wet seasons. The head is carried low and the sheep is dull and appears to suffer from defective eyesight. The animal loses control of one or more legs and shows a very peculiar gait and may die at this stage. If it survives it will likely show the symptoms of "turnsick," and will travel in circles until exhausted. The only cure is trephining. This disease is not common in this country.

Catarrh. Sheep suffering from this disease will be noticed sneezing and snuffling. A discharge from the nostrils is accompanied by inflamed eyes, and generally appetite fails. Well nourished sheep, kept in dry quarters free from drafts, rarely take catarrh. When noticed give flaxseed tea three times per day. Steam the head over boiling water to which a little carbolic acid has been added. Some recommend giving 1 dram sweet spirits of nitre and 15 grains powdered digitalis twice a day. Clean, dry, well-ventilated quarters should be the first consideration.

Inflammation of the Lungs. Occasionally a sheep will fall a victim to this trouble due to exposure to cold, wet weather particularly just after shearing. They will be noticed to be dull and off feed, breathing rapidly, coughing and growing weak.

Keep warm and give flaxseed tea and two drams sweet spirits of nitre and some stimulant.

Stretches or Constipation. This trouble, while not very prevalent, is still not uncommon where sheep are confined for long periods on dry feed alone. Stretches is simply a symptom of constipation. The sheep stretch and strain in an effort to defecate. Sheep breeders should plan to have roots, preferably swede turnips, or good sweet silage for their sheep in winter as a preventive of this trouble and should plan where grain is fed without sufficient succulent feed to give at least a third of the grain ration good wheat bran. To relieve constipation give 6 to 8 ounces of raw linseed oil with about 2 drams turpentine. Constipation is sometimes noticed in young lambs. For these there is nothing better than castor oil.

Diarrhoea. Diarrhoea is not a common disorder in sheep. It generally results

from bad management or overfeeding on succulent feed. Sudden changes in diet may cause it. Too much green feed, an oversupply of roots or frozen or immature feed are contributing causes.

First remove the cause. Feed regularly. Administer a mild laxative such as castor oil for lambs or raw linseed oil for mature sheep. In bad cases add to the oil a dram of laudanum and the same amount of ginger; this is the dose for a mature sheep. Cut it in two for a lamb of three months. Keep dry and feed carefully.

Colic and Bloat. If spasmodic colic appears due to sudden changes of feed or access to injurious herbs or spoiled feed give a teaspoonful each of laudanum and sweet spirits of nitre dissolved with a teaspoonful of ginger and two teaspoonfuls of baking soda in one-half pint of water. Give an injection of warm water per rectum and a dose of raw linseed oil.

Blotting may occur if sheep are suddenly turned on wet clover or rape when hungry. They should be gradually accustomed to these feeds, and turned on at first only when the feed is dry. Bloat may follow colic. It may be necessary to puncture. For this use a trocar and cannula. If this instrument is not procurable use a pocket knife and puncture on the left side at the most distended point just in front of the hip bone. After puncturing give a dose of 4 to 6 ounces of raw linseed oil.

The Stomach Worm. There are several varieties of stomach worms but they are, as a general thing, less than an inch long. They invade the fourth stomach, are twisted, fine and hair-like. These worms in the stomach produce eggs which pass out with the faeces, hatch in any temperature above 40 degrees Fahrenheit and are taken back in the digestive tract of the lamb or sheep. The eggs hatch in wet places or dirty stagnant water. The worms do most damage in lambs, and usually start soon after the sheep go out on grass.

Lambs infected with this pest show more marked symptoms than do older sheep suffering from the same trouble. They lose flesh, appetite fails, they appear dull, wool becomes dry, and colic with black diarrhoea may develop. As with most diseases the weaker lambs and sheep are those most likely to become severely affected.

Keep the sheep thriving well by good feed and frequent change of pasture. Old pastures upon which sheep have grazed for many years may be infected, and should be plowed up and dressed with an application of lime. Because they are in the fourth stomach of the animal the worms are rather difficult to reach. Gasoline has been used in one-to-three-dram doses, but is more valuable as a preventive than a cure, for it is doubtful whether it ever reaches the fourth stomach in sufficient strength to kill the worms. Turpentine is sometimes used. Kamala may be given once daily in from one-half to one dram doses in thick gruel or raw linseed oil. Bluestone is said to be the best remedy. Dissolve 2 ounces of finely powdered bluestone in a quart of boiling water. Add water until it reaches a gallon. Give a lamb three months old 1 ounce; six months, 1½ ounces; one year 2½ ounces; eighteen months, 3 ounces; two years 3½ ounces.

Tapeworm. Some eight different species of tapeworm are harbored by the sheep, but the most common type found in the Province of Ontario is known as *Toenia expansa*. This species of tapeworm may run from eight or ten feet in length up to eighteen feet, and from about 1-25 of an inch wide at the head to nearly ½-inch at the tail. The entire worm is yellowish white in color and is composed of segments about one-quarter of an inch long.

The experience of the writer has been that lambs suffer more from this trouble

than do sheep. In 1918 the lambs in the O. A. C. flock were badly infested, but the ewes were practically free from the trouble. Infested sheep or lambs do not thrive, the skin becomes pale and weakness follows, accompanied by a dry condition of the wool and very often by digestive troubles. The surest symptom is the finding of segments of the worm in droppings. If this trouble is suspected close observation should be given the droppings of the sheep and lambs.

Fast the sheep or lambs twenty-four hours before treatment. Then give one dram oil of male shield fern in three ounces of castor oil to a mature sheep or half the dose for a lamb. Give as a drench by means of a long-necked bottle. Kamala in $1\frac{1}{2}$ dram doses to mature sheep given in thick gruel or treacle and followed by 3 ounces of castor oil in a few hours will expel the worms. Keep sheep in after treatment until all worms are expelled. This will take from 24 to 30 hours. Put out on new pasture, as if any segments of tapeworm are picked up by the sheep or lambs they will develop. The trouble is most common in wet years and on wet pastures.

Intestinal Round Worms and Nodular Disease. There are several species of round worms infecting intestines of sheep the worst of which is that which causes nodular disease or "knotty gut." These are picked up by the young lambs and sheep on pasture. Frequent changing of the flock from one pasture to another, and the growing of rape and such green crops for pasture, are the best preventive measures. Gasoline in one-to-three-dram doses given in milk is used by some shepherds, and turpentine is relied upon by many others. If one sheep or lamb in the flock is known to be affected, it is safe practice to treat the entire flock. A solution such as that recommended for stomach worms may be tried. These treatments are effective with many species, but will not cure nodular disease. This latter may be recognized in post mortem examinations by the knotty condition of the intestines caused by the encysted worms for which, as yet, no remedy has been found. Sheep badly affected become emaciated and very weak.

Maggots. Occasionally the stumps remaining after lambs' tails have been docked late in the season become fly blown and sometimes ewes not kept well trimmed behind suffer from the same trouble through their hind parts becoming wet from urine, etc. Pine tar applied to such places is a good preventive. All sheep should be kept trimmed. Spirits of turpentine will clean the maggots out of such places and after application the spots should be smeared with the tar. Gasoline and lime may also be used to good effect to get rid of maggots.

Lice and Ticks. Sheep are liable to be troubled with lice or ticks, or both. Lice are more feared by the shepherd than are ticks. Both cause loss of flesh, damage and loss to wool and general debility in the flock. Ticks and lice always thrive best on poorly-cared-for sheep and lambs. Sheep, pestered with these parasites, rub and scratch a great deal. Regular dipping in a standard dip just before the sheep go out to pasture in the spring, and on a warm day in the late fall before they go into winter quarters, generally keeps the flock fairly free from the ravages of both these pests. Sheep and lambs should be immersed in the dip for at least one minute.

Scab. Sheep scab is a very contagious disease, and when it appears must be carefully and thoroughly treated. It is caused by a mite which is difficult to see with the naked eye. Infested sheep commence to lose their wool usually on the upper part of the body and around the neck. A flock well fed and cared for is more resistant than one poorly nourished and badly housed. Sheep suffering from scab are very itchy, do considerable rubbing and scabs appear on the body. The

insects live under these crusts. Wool drags from the sheep's body and unless treatment is promptly given the disease spreads through the entire flock.

Dipping is the only remedy. Sheep should remain a full two minutes in a dipping tank, the head should be plunged beneath the dip and the material should be thoroughly brushed into the scabby surface. At least two dippings are necessary at intervals from ten to twelve days. In bad cases a third dipping is advisable. Use a standard dip. If possible clip the sheep before dipping. After dipping place the sheep in clean quarters. Disinfect all feed troughs, racks, pen, etc., by applying some good coal-tar product.

Caked Udder, Inflammation of the Udder, Garget. The sheep's udder may become hard and swollen at lambing time and some difficulty may come just after weaning. The shepherd should avoid heavy feeding at and before lambing time and should keep his sheep in a dry, well-ventilated, comfortable place. If not watched, caked udder may develop into inflammation or garget, a disease most common in wet, cold seasons. Ewes suffering from these troubles should be purged with 4 ounces of Epsom salts in a half pint of warm water. Hot fomentations should be applied to the udder. Rubbing is beneficial and water just as hot as can be borne should be applied twice per day for 20 minutes to half an hour at a time. In real severe cases it may be necessary to poultice. After bathing with hot water rub well with lard or some such substance. Feed lightly. Give a bran mash.

Sore teats. Sore teats are generally the result of bad housing of milking ewes in wet, cold weather or are caused by the lambs biting them when the ewe has not enough milk to satisfy her offspring. Apply three times daily vaseline or sweet oil and glycerine or a little melted mutton tallow. Care should be taken to heal sore teats else udder trouble is liable to develop.

Rickets. Rickets sometimes appear in young lambs. They show weakness in the hindquarters, and will reel and fall as they try to walk. May be due to close-in and in-breeding, to poor feeding of the dam during pregnancy, to a lack of mineral or other life-giving ingredient in the feed of the dam, or to undue exposure.

Feed both the lamb and dam well. Do not in-breed too closely. Sell affected lambs as soon as they are big enough for the butcher.

Wool Balls in Stomach. The presence of lice or ticks may cause young lambs to pull their wool and some of this may get into the stomach. Sometimes lambs pull wool from their mothers. All wool should be carefully clipped from around the ewes' udders just before they lamb if they have not already been shorn. Wool taken into the lamb's mouth is very often chewed and swallowed when it forms wool balls in the stomach. The lamb becomes dull and stupid and finally refuses to nurse or eat. A dose of linseed or castor oil will sometimes relieve a lamb of this trouble, but wool balls generally result in death.

Sore Eyes. This trouble may be ophthalmia or it may be due to constitutional disturbance. It is most common in lambs. Eyes should be bathed in warm water and a sulphate of zinc solution dropped into each eye with a dropper. To make the solution dissolve 2 grains of sulphate of zinc in one ounce of water. It is always safer to isolate all sheep and lambs affected, as the disease may be a contagious form. Lambs should not be exposed to storms or drafts. Feed on laxative feed and it is generally advisable to begin treatment by the administration of a mild laxative such as a dose of castor oil. Boracic acid is also used to good advantage in many flocks. If pink eye should develop and scum appear over the eye blow a little burnt alum into it.

Infectious Sore Mouth. Occasionally an outbreak of infectious sore mouth occurs. The sheep cannot eat and soon become thin and emaciated. The edges

of their lips, both upper and lower, become sore and scabby. Treatment consists in arresting the spread of the disease by isolating all infected animals and applying to the sores carbolized vaseline or some other cleansing and healing ointment at least once daily until cured.

Calculi. Breeding rams are sometimes bothered with calculi in the urethra. They arch the back, become stiff in the hind quarters and soon become useless. Feeding mangels to breeding rams is liable to cause this trouble and should not be practised. An operation is generally necessary to effect a cure, and all but valuable breeding rams should be slaughtered for mutton when this trouble appears.

Liver Trouble. There are several diseases of the liver which it is not necessary to mention here, but the writer has seen several sheep die due to a clogged condition of the liver which ultimately resulted in its breaking down altogether. The cause seemed to be overfeeding on grain and too little exercise. The sheep go off their feed, show a slight cough and finally weaken and die. Once established no known treatment will effect a cure.

Eversion of the Womb. Occasionally just after a difficult parturition the womb may be protruded. In such cases remove the placenta, wash the womb with a two per cent. carbolic acid solution and have an attendant place the ewe on her side and hold her hind quarters about a foot off the ground by grasping the hind legs. Flush out the womb with a pint of lukewarm water in which a little powdered alum has been dissolved and return it to place. The ewe should then be tied for a few days in a narrow stall raised six or eight inches higher behind than in front.

Administering Medicines. In administering medicine to a sheep always give with the sheep standing. Secure a long, slender-necked bottle for drenching. Every shepherd should have a funnel and a graduated measuring glass. Back the sheep into a corner, stand astride of it and with one hand under the lower jaw raise the head just enough that the liquid will run to the throat. Insert the neck of the bottle in the side of the mouth and pour slowly as the sheep swallows. Do not rush the drenching. Give young lambs medicine in the mother's milk.

WOOL.

While it is true that practically all the breeds of sheep kept in Ontario are mutton sheep and the fleece is more or less of a by-product, yet wool selling at over the half-dollar mark per pound the production of a heavy fleece of good quality is a very important feature of sheep husbandry. *Quantity* and *quality* are the essential features of a good fleece. Neither of these can be expected unless the flock is maintained throughout the year in a good condition, and at the same time care taken to keep all foreign matter such as chaff, burs and sand out of the wool. The weight of the fleece depends on the density and length of the wool, and this varies to some extent with the different breeds. A good growth of wool is impossible, no matter what breed, unless the sheep has been well nourished. The growth of wool depends just as much on good feeding and management as does the growth of the animal's body. Quality has reference to strength of fibre, the absence of cotted wool and kemp and a fleece that is free from dirt and chaff. The wool produced during a period of sickness or low condition of the sheep is bound to be weak in fibre. Freedom from cotted wool is dependent upon a regular supply of yoke or grease secreted from the pores of the skin. Here again sickness or low vitality means a scanty supply of yoke, with the result that the wool fibres become

interlocked, which is known as a cotted condition. The amount of dirt that collects in the fleece will depend largely on the care exercised in handling the flock.

During the winter more or less chaff and straw is bound to collect in the wool, but by feeding from properly constructed feed racks and avoiding as far as possible having the feed lodge on the necks and backs of the sheep, it is possible to produce wool that will be reasonably clean. As has already been suggested, the amount and quality of the wool produced in any flock will depend very much on the feeding and general management of the flock throughout the entire twelve months of the year and from this standpoint alone it is well worth while to give the proper care and attention at the right time. It may mean the difference of several cents per pound in the selling value, as well as an increase in the weight of the wool.



Grades of wool.

Left to right—Medium clothing, fine medium combing, medium combing, low medium combing, low combing, coarse.

Within the past three years considerable attention has been given to the grading of the Ontario wool clip. In common with any commodity, wool that is marketed after being properly graded will usually command a higher price than that offered without any respect as to quality and values. When wool is sold according to the different grades the farmer that produces a good quality of wool usually gets a premium for it. All cotted and black or gray wool as well as the dung locks are sold separate from the good fleeces. The basis for grading is determined by the length, fineness or coarseness, strength and purity of the wool. It is difficult to say definitely the grade into which the different breeds would be classed. The table given herewith is the result of the grading of approximately three quarters of a million

pounds of wool in Ontario this year, and will give a general idea of the grades into which the different breeds are classed. In connection with this table it should be mentioned that many fleeces might be on the border line and could easily have been admitted to a grade higher or one lower.

Breed	Fine Medium Combing	Medium Combing	Low Medium Combing	Low Combing	Fine Medium Clothing	Medium Clothing	Coarse
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Leicester .....	....	....	15.	30.4	....	....	45.6
Lincoln.....	....	....	.4	1.6	....	....	98.
Cotswold .....	....	....	....	5.	....	....	95.
Southdown.....	8.9	20.9	1.8	....	42.8	25.6	....
Shropshire.....	.9	71.6	12.9	....	1.4	13.2	....
Oxford .....	.4	46.2	49.5	3.1	.6	.2	....
Suffolk	34.4	60.4	....	....	3.1	2.1	....
Hampshire.....	5.4	67.5	8.7	....	4.8	13.6	....
Dorset.....	....	74.8	20.	....	....	5.2	....

The illustration showing the different grades of wool is fairly representative, and may be an aid to the farmer as indicating into what class his wool would go.

LEGISLATION FOR THE PROTECTION OF SHEEP.

The Legislature of the Province of Ontario passed an Act in 1918 to impose a tax on dogs and for the protection of sheep. This was amended in 1919, and as it now stands the annual tax on dogs, subject to the provisions of paragraph 9a section 100 of the Municipal Act and of subsection 3 of this Act is \$2, and if an owner has more than one dog \$4 for each additional dog, and \$4 for a bitch if only one and \$6 for each additional bitch. Any local municipality may, at any time, increase such tax. Owners of kennels of pure-bred dogs registered in the Canada Kennel Register may, in any year, pay the treasurer of the municipality \$10 as a tax upon the kennel for that year, thus exempting them from any further tax for that year.

Any person may kill any dog which is found pursuing, worrying or wounding any sheep, or which is found straying between sunset and sunrise from the premises on which such dog is habitually kept, and no conviction shall be a bar to any action by the owner or possessor of any sheep for the recovery of damages for the injury done to such sheep. Following are extracts from the Act:

EXTENT OF LIABILITY OF OWNER OR KEEPER OF DOGS.

10.—(1) The owner of any sheep killed or injured by any dog shall be entitled to recover the damage occasioned thereby from the owner of such dog, by an action for damages or by summary proceedings before a justice of the peace, who is hereby authorized to hear and determine such complaint, and proceed thereon in the manner provided by *The Master and Servant Act*, or as nearly as may be, and the said Act, *mutatis mutandis*, shall, except as to the limit of jurisdiction, apply to all proceedings taken under this section and to the enforcing of judgments and to the time and manner of making appeals.

(2) The aggrieved party may recover in such action or proceeding, whether or not the owner of such dog knew that it was vicious or accustomed to worry sheep.

(3) If it appears at the trial that the damage or some part thereof was the joint act of some other dog, and of a dog owned by the person charged, the court, judge or justice may, by the judgment or conviction, apportion the damages among and against the respective owners of the dogs, as far as they are known, in such proportions as may be deemed just.

(4) If it appears at the trial that the damage was occasioned by a dog, the owner of which is known, and a dog the owner of which is unknown, or has not been summoned to appear, the court, judge or justice may determine and adjudge as to the proportion of the damage which, having regard to the evidence adduced as to the strength, ferocity and character of the various dogs shewn to have been engaged in committing such damage, was probably done by the dogs the owners of which have been summoned to appear, and shall determine in respect thereof and apportion the damage which the court, judge or justice determines to have been probably done by the dogs whose owners or keepers have been summoned, amongst the various owners or keepers who have been so summoned.

(5) The like proceedings may thereafter be had against the owners of the dogs which so contributed to the damage.

11. The owner of any dog, to whom notice is given of any injury done by his dog to any sheep, or of his dog having chased or worried any sheep, shall, within forty-eight hours after such notice, cause such dog to be killed; and for every neglect so to do he shall incur a penalty of \$2.50 for each dog, and a further penalty of \$1.25 for each dog for every forty-eight hours thereafter, until the dog is killed. If it is proved in the proceedings for the recovery of such penalties, that such dog has worried or otherwise injured such sheep, unless the owner proves that it was not in his power to kill the dog.

12. When the owner of any sheep so killed or injured proceeds against the owner of the dog which committed the injury, before a justice of the peace, and is unable on the conviction of the offender, to levy the amount ordered to be paid, for want of sufficient distress, the council of the municipality in which the offender resided at the time of the injury shall order their treasurer to pay to the aggrieved party the full amount ordered to be paid by the justice by the conviction, in addition to the costs of the proceedings before the justice and before the council.

COMPENSATION WHERE OWNER UNKNOWN.

13. Where the owner of any dog killing, injuring, terrifying or worrying sheep is not known, the municipality in which such sheep were so killed, injured, terrified or worried shall be liable for compensation to the full amount of the damage sustained, but no municipality shall be so liable unless application has been made for damages as herein provided within three months after such sheep have been so killed, injured, terrified or worried.

14. The amount of damage sustained as aforesaid shall be determined in the following manner:

(1) The council of every local municipality shall appoint one or more competent persons to be known as Sheep Valuers. Within forty-eight hours after the discovery of any damage as mentioned in the preceding section, the owner of the sheep or the clerk of the municipality shall notify a sheep valuer, who shall immediately make full investigation and determine the extent of the damage. The sheep valuer shall make his report in writing, giving in detail the extent of the injury and the amount of damage done, to the clerk of the municipality and shall at the same time forward a copy of such report to the owner of the sheep damaged.

(2) Where the owner of such sheep considers the award inadequate to cover the loss sustained, he may appeal to the Minister of Agriculture who may name a competent arbitrator to make a further investigation and the award of the arbitrator so named shall be final; provided the appeal to the Minister shall be made within one week after the award of the local valuer has been received, and shall be accompanied by a deposit of twenty-five dollars (\$25), which shall be forfeited if the award of the local valuer is sustained.

(3) When the amount of damage has been finally determined as aforesaid, the treasurer of the municipality shall forthwith pay over to the owner of the sheep the amount so awarded.

(4) If no sheep valuers are appointed by the municipal council, or the clerk or the sheep valuers do not perform the duties provided for by this section or any of them within the times specified, where the time is specified for the doing thereof, or where no such time is specified, within a reasonable time, the person who has sustained the damage shall have a right of action against the municipal corporation for the amount of the damage, recoverable in any court of competent jurisdiction.

15. After the owner of a sheep has received any money from a municipal corporation under any of the preceding sections, his claim shall thenceforth belong to the municipal corporation, which may enforce the same against the offending party for its own benefit, by any means or form of proceeding that the owner was entitled to take for that purpose, but if the corporation recovers from the offender more than it paid to the owner, besides costs, it shall pay over the excess to the owner.

16. Subject to the provisions of subsection 2 the owner of any sheep killed or injured while running at large upon any highway or unenclosed land, shall have no right to compensation from a municipal corporation.

(2) The council of a township in unorganized territory may by by-law passed with the assent of the municipal electors provide that the corporation shall be liable for compensation to the full amount of the damage sustained by reason of sheep being killed or injured while running at large upon any highway or unenclosed land.

17. Except as herein otherwise provided, *The Ontario Summary Convictions Act* shall apply to prosecutions under this Act.

18. The times and the method of procedure set out in this Act shall be regarded as merely directory and a proceeding which is in substantial conformity with the Act shall not be open to objection on the ground that it is not in strict compliance therewith.

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