

**SHEEP** (AS. *sceap*, sheep). A hornless or hollow-horned ruminant belonging to the genus *Ovis* and covered with a fleece of wool varying in color, length, fineness, and strength of the fibre. The male is designated a ram or buck (or wether when castrated), the female a ewe, and the young a lamb. The principal products are wool, meat, and sheepskin. The entrails are used for sausage casings or, when dried and twisted, for musical instrument strings (catgut); the fat yields tallow and suet; and the milk in some countries is used, either alone or with cow's milk, for making cheese (q.v.). Flocks of special milk breeds are kept primarily for their milk. In mountainous parts of India sheep are used as beasts of burden. See PACK TRANSPORTATION.

Sheep have contributed largely to the wealth and development of every country where man has introduced them as adjuncts of settled agriculture. Although they flourish best in temperate climates, they readily adapt themselves to changed climatic and other conditions, and breeds have been developed which thrive from the sea level to the mountain heights and upon a great variety of soils and vegetation.

Sheep are supposed to have been developed from wild forms to which they are related, but opinions differ as to their progenitors. They are most commonly thought to have descended from the mouflon, the musimon, or the argali. No domesticated sheep were found in North America by the early explorers. The wild Rocky Mountain sheep has neither been successfully domesticated nor crossed with the domestic sheep. Under domestication, due partly to differences in altitude, climate, feed, etc., and partly to man's intervention, many breeds and varieties of sheep have been produced.

**Breeds.** Sheep are commonly classified according to their fleece into long-wooled, middle or medium-wooled, and short or fine-wooled breeds. (See WOOL.) The long-wooled breeds, e.g., Leicesters, Lincolns, and Cotswolds, are usually white-faced, somewhat coarse-fleshed and lethargic, and are of English origin. The Leicester is of special historic interest because it was the first breed to be improved by skillful selection and breeding and because it has been used in improving all the other long-wooled breeds. This breed, whose progenitors were the long-wooled sheep of the Midland counties of England, owes its origin to Robert Bakewell, who developed it purely by selection with reference to a definite mental standard and apparently without resorting to crossing with other kinds or breeds. This Improved Leicester, which has persisted practically as Bakewell developed it, is a hornless sheep, with a somewhat lashy wool 7 or 8 inches long, terminating in a short twist which gives it a fine curly appearance. The animal is somewhat smaller than the original type, but is more symmetrical, thicker, deeper, of better fattening qualities and earlier maturity. Bakewell made no attempt to improve the wool, and the pure-bred stock tends

to produce a very fat mutton, which is not now in demand. The great value of the breed lies in its use for crossing purposes. The Border Leicesters, regarded as a separate breed, differ from the Leicesters chiefly in the shape of the head, which is bald, the Leicesters usually having a tuft of wool on the head. The Lincoln resembles the Leicester in general form and might almost be mistaken for it, although it is larger, being the heaviest sheep in the British Isles. The bright, lustrous wool, which masses in characteristic flakes or strands, is extraordinarily long, samples measuring 21 inches. The breed is the product of Leicester crosses upon the old Lincoln stock. As a mutton sheep it is considered by many inferior to the Down breeds, but for crossing purposes it is in great demand, especially on the sheep ranges of the northwestern United States. The Cotswold, one of the most ancient, best known, and most popular of the recognized English breeds, originated on the bleak hills and uplands, where it developed a hardihood and an ability to rustle less evident in other long-wooled breeds. The head is wedge-shaped, without horns, the face covered with white hairs, the lips black, the ears long and pendulous, and the forehead covered with a flowing topknot—one of the most characteristic features of the face. The fleece is long and heavy, although inferior in both respects to that of the Lincolns. The breed has been used in establishing several crossbreeds. The Black-faced sheep and the Herdwicks are mountain breeds, often horned, having long, rather coarse or hairy wool. They are not, however, commonly classed with the long-wooled breeds.

The medium-wooled breeds include the Down sheep, which inhabit the chalk hills of southern England, the Shropshires, and the Dorset Horned. All except the last are hornless, and the face in several breeds is dark brown to black. The Southdown, or Sussex, one of the purest of the English breeds, antedates William the Conqueror. It has been developed by selection, and not by crossing with other breeds, and has been used to improve the dark-faced Down breeds. The horns, which it originally had, have long since disappeared. It has fine short wool, which extends to the forehead and face, and has long been renowned for its mutton, which is close-grained, tender, dark, and juicy. It is a rather small sheep, but its size has been increased by selection. On account of its beauty and highbred appearance it is a favorite for country estates and parks, especially in England. The Shropshire is a crossbred sheep. The original stock was small, horned, and had a black, brown, or spotted face. The improvement consisted in crossing with the Leicesters, the Cotswolds, and the Southdowns. The breed to-day is a striking illustration of the stage of perfection which can be attained by judicious crossing and selection. The carcass is large, covered with a dense elastic fleece of good length and medium fineness, the face is rich brown, and the head covered with a close-fitting cap of wool. The breed is a very popular one and readily adapts itself to various climates and scanty pastures. The Improved Hampshire Down is the heaviest of all the Down breeds, the Oxfordshire Downs vying with it in this respect. The face is dark, the lips black, the ears rather long, often falling slightly forward, the shanks rich dark brown,

SHEEP



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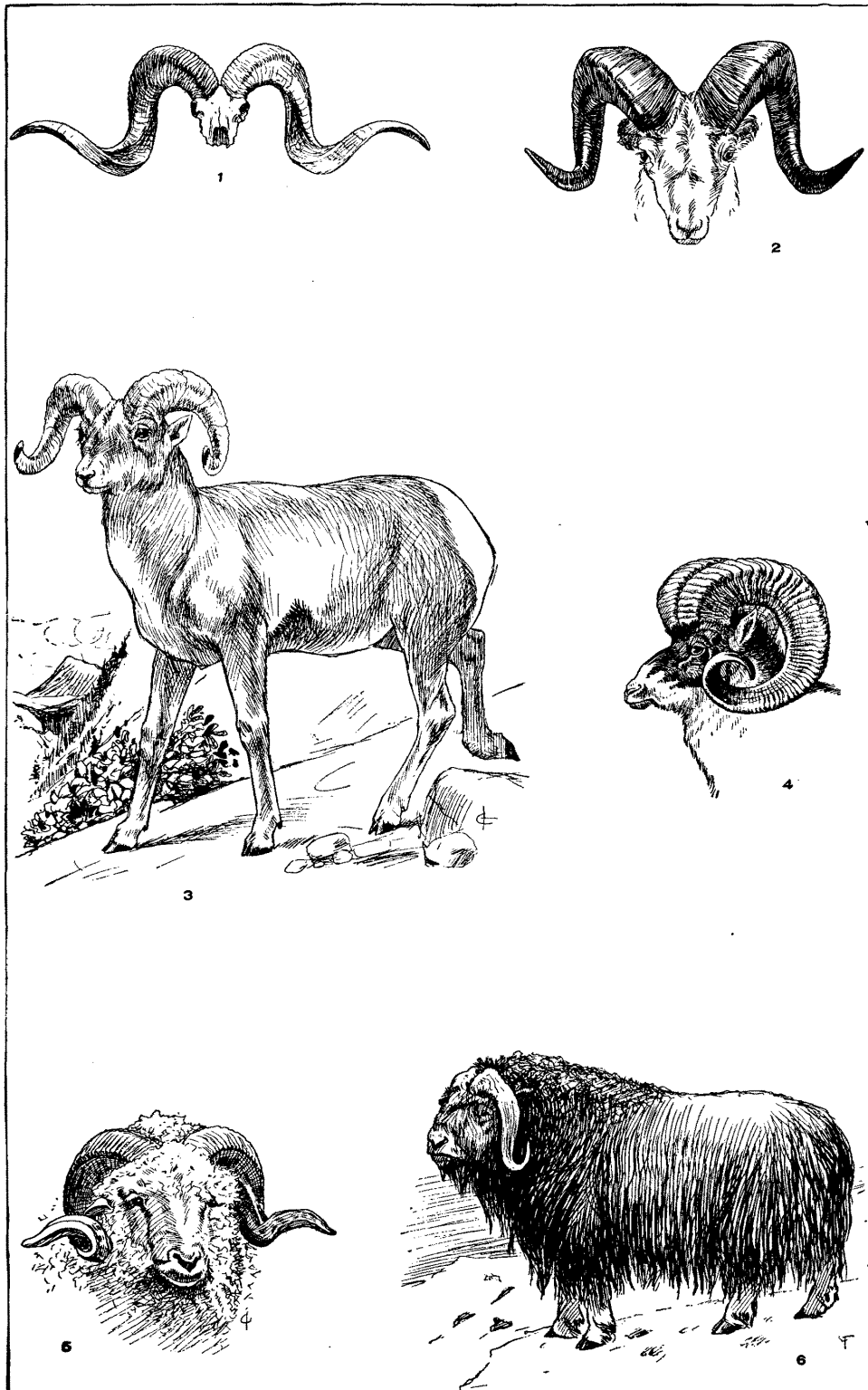


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1. SHROPSHIRE RAM.  
2. SOUTHDOWN RAM.  
3. CHEVIOT RAM.

4. LINCOLN RAM.  
5. RAMBOUILLET RAM.  
6. COTSWOLD RAM.

WILD SHEEP AND MUSK OX



1. HORNS OF PAMIR SHEEP, front view. See No 4.  
2. KAMTCHATKAN ARGALI (*Ovis nivicola*).  
3. ROCKY MOUNTAIN BIGHORN (*Ovis Canadensis*).

4. PAMIR SHEEP (*Ovis Poli*).  
5. MERINO RAM.  
6. MUSK OX (*Ovibos moschatus*).

the fleece white, thick, covering the top of the head, and made up of fine strong fibres. The animals mature early, and the lambs make very rapid growth and fatten early. They respond to good feeding and stand close folding, being in their native country very often hurdled upon pasture crops. The Oxfordshire Down originated about 1833 by crossing the Cotswold on the Hampshire Down and was known prior to 1859 as the Down-Cotswold. By careful breeding it has become a distinct race. These sheep have dark-brown faces, long, thin ears, and a comparatively close fleece, the wool, which covers the head, being longer and more flowing than upon the Shropshire, which it resembles somewhat closely. The Suffolk Downs resemble the preceding, but have very black faces and lack wool between the ears. They were derived from the small and hardy horned Norfolk and Suffolk sheep and have been greatly improved by the Southdown. The Dorset, or Dorset Horned, an English breed, is a survival of a white-faced, horned, short-wooled race, which has descended unmixed from a remote period. It is rather larger and longer in the legs than the Southdown. These sheep are unusually prolific and produce their young so early that the lambs may be sent to market before those of most other breeds. They are hardy, quiet, good feeders, and readily adapt themselves to new conditions. The Cheviot is an ancient, white-faced, hornless, short-wooled sheep, reared in the Cheviot Hills and belonging to the mountain breeds, in which class it is unexcelled.

The foundation of the present fine-wooled sheep of all countries is the Spanish Merino, a type which antedates the Christian era. These sheep were held in Spain by the kings, the nobles, the clergy, and others, and since their exportation was prohibited and extreme care was bestowed upon the fleece, Spain long controlled the fine-wool trade of the world. Among the families of the Merinos were the Escorial, Infantado, Poular, Negretti, Guadaloup, and Aguirres, which for years contributed largely to the support of the Spanish government. Until the nineteenth century, it is said, none were exported except by royal favor or by smuggling. In 1765, 300, introduced into Saxony by royal courtesy, became the foundation of the Saxon Merinos. During the first quarter of the nineteenth century Spanish Merinos were introduced into the United States, and from these the American and the Delaine Merinos have been developed. The moist climate of Great Britain is unfavorable to the growth of the finest wools, and hence the Merino has never been successfully propagated there. It formed the basis of the vast flocks of Australia and New Zealand. The fleece covers the whole body, down to the hoofs and nearly to the tip of the nose. The rams have wide, wrinkled horns. The short, full neck is covered with heavy folds of skin in both males and females. Merino mutton is of inferior quality. The Rambouillet, or French Merino, which originated from the Spanish stock imported by Louis XVI and is named from his estate, is regarded as a distinct breed.

Iceland sheep are remarkable for frequently having three, four, or five horns, as do also some sheep of northern Russia. The broad-tailed or fat-tailed sheep, found in many parts of Asia, are chiefly characterized by the enormous accumulation of fat on each side of the tail bone. The tail is esteemed a great delicacy, and to pro-

tect it from being injured by dragging on the ground it is sometimes supported by a board or small pair of wheels. The fat of the tail is often used in place of butter. The fat-rumped sheep of Tartary have similar accumulations of fat on the rumps, falling down in two masses behind and often concealing the short tail. The Astrakhan or Bokharian sheep have very fine wool twisted in spiral curls. The specially beautiful pelts of very young or still-born lambs of this variety are known as Astrakhan fur and are used for trimming garments. These sheep have been introduced into portions of the United States and Canada, with a view to encouraging the home production of the fur.

Sheep Raising was originally and to a large extent has continued a pastoral industry; and because sheep can thrive upon scanty vegetation and succeed best when given free range, they are popular in countries where land is cheap and pastures abundant, and where the industry can be carried on extensively, as in South American countries (notably Argentina), Australia, New Zealand, the western United States, portions of Russia, and South Africa.

In the United States sheep raising has undergone many changes, due to the prices and demands for certain qualities of wool (q.v.) and mutton, the tariff, and other conditions. The census of 1900 showed a total of nearly 62,000,000, that of 1910 about 53,000,000, and the estimate for Jan. 1, 1916, 49,162,000. Among the causes that have contributed to the diminution of number of sheep are the scarcity of labor required for their care, the high prices of sheep and lambs for slaughter, the displacement of sheep by expanding dairying, deficient pasturage and forage on account of drought, destruction by dogs, the settlement of range land previously occupied by sheep, the low price of wool, and the increased value of land. Of the total number in 1914 nearly 55 per cent were on farms and ranges in the western division of the country. Wyoming headed the list, with 4,500,000 head, followed by Montana, Ohio, New Mexico, Idaho, Oregon, California, etc.

The growing appreciation and the increased demand for lamb and mutton in the United States has increased the revenue from flocks, and has resulted in changes in the kind of sheep kept. As an indication of the increase in lamb and mutton consumption, the reports of the Union Stock Yards at Chicago may be cited. In 1885 about 1,000,000 sheep were received for slaughter, in 1890 a little over 2,000,000, in 1900 about 3,500,000, and in 1914 over 6,000,000. A large proportion of these came originally from the sheep ranches of the West, although many were fattened farther east. In 1870 more than four-fifths of the sheep in the United States were either pure-bred or grade Merinos. During recent years there has been a marked tendency to increase the mutton breeds or crosses having better mutton qualities. In the States east of the Mississippi River the coarse or medium-wooled mutton breeds have gradually gained prominence because, as population has increased, meat has become more important than wool. In the Southwest the Merinos still predominate, being held by some to be better rustlers; but in the Northwest the aim of the majority of sheep raisers is to breed a general-purpose animal, with wool of medium fineness, shearing seven to eight pounds, and of good mutton qualities. This is usually brought about

by crossing the Merino or Rambouillet with the Cotswold or Lincoln, pure-bred stock, especially bucks, being the foundation of the flocks on the better ranches. A recent importation of Corriedale sheep to that section from New Zealand will probably furnish a basis for the production of the type of general-purpose animal desired.

The management of sheep under range conditions differs widely from that adopted in the Eastern States or in older countries. Formerly the sheep were kept almost entirely upon the public domain, but with the increasing competition for this open range and the settling of the country, the practice of owning or leasing land has become very common. In many cases immense tracts of land are acquired by lease or purchase, and this usually means the control of a much larger tract. The leased tracts are inclosed with fence, and are supplied with facilities for watering the stock. Generally, however, the sheep raiser does not own or lease all the land required for range, but relies upon the open ranges and the forests in the mountains for summer grazing. These tracts are rapidly diminishing, and grazing in the national forests is now restricted, fees being charged for the privilege. The land which he controls is the winter range, and is usually located in proximity to the headquarters of the ranch. On the range the bands number from 1500 to 3000 sheep, depending upon the character of the country. Each band is in charge of a herder, assisted by dogs which prevent the sheep from straying away and guard them at night. Camp tenders supply the herders' wants and maintain a lookout for good range. In the fall the sheep are brought to the winter range, which is more protected from the snow and has not been fed down during the summer. If no provision is made for feeding, when storms prevent ranging heavy losses are likely to occur. The best sheep men put up alfalfa (q.v.) or prairie hay for such emergencies, and some even plan to fatten the sheep somewhat during winter by this extra feeding, to prepare them for the market.

In the early days buildings were rarely used, but experience has shown that while they are not absolutely essential, increased profits are secured and the business made more certain by providing protection for the sheep, especially during lambing time. This protection usually consists of rough sheds 50 or 75 feet wide and often 200 feet long. Corrals, usually without cover, are located at various points over the winter range, and the sheep are placed in these over night. The more substantial feeding corrals are located near the ranch house. They are usually connected with open sheds in which the sheep may seek protection against snow and rain.

In the spring after lambing time the sheep are sheared, either by hand or with machine, and usually dipped as a precaution against ticks and disease, before they are taken out upon the summer range. In the Western States shearing is carried on by shearers who begin in early spring in Texas and Arizona, where two annual shearings are made. As the season advances they travel northward to Montana, where the work ends in early July. They become so expert, and shear with such rapidity, that an average of from 90 to 120 sheep a day is usual. The maximum record is about 250 sheep in a day. Since about 1895 machine shearing has progressed rapidly, because more wool, an

evener fleece, and less injury to the sheep's skin are secured. The motive power is usually a gasoline engine, and shearing plants are constructed which contain from 10 to 40 clippers. No sorting of the wool is done on the ranch, except that the wool of black sheep is sacked separately, since it brings a higher price. It is conceded that the American method of preparing wool for market is behind that used in Australia and New Zealand, and as a consequence the adoption of the so-called Australian system of shearing and classifying wool is being agitated.

The cost of managing sheep under range conditions necessarily varies within rather wide limits. If the sheep raiser makes use of the public lands without paying rental and taxes, and does not practice winter feeding, the business may be conducted at a cost of from 60 to 75 cents per head per year. On the other hand, sheep raisers who maintain extensive plants, feed in winter, and rent or own much of their grazing land have found that the cost varies from \$1.25 to \$1.50 per head. The income under range conditions varies according to the locality and the skill and intelligence of the sheep owner. In localities where the wool is comparatively free from sand, the income from the fleece is from \$1 to \$1.50 per sheep. The lambs may be sold in the fall at \$5 to \$6 a head, depending upon their condition; and by feeding for a short time additional profit may be obtained. Some of the best sheep managers make a profit of \$2 per head, but such high returns are above the average and cannot be realized every year.

Although sheep are well adapted to scanty vegetation and are capable of giving good returns on the semiarid lands, they also respond to liberal feeding and can be made to return good profits under farming conditions. The high-priced agricultural lands of Great Britain maintain an average of 680 sheep per thousand acres; those of Scotland as high as 1380 sheep per thousand acres of agricultural land. In the farming States, where mutton is the primary consideration and wool incidental, sheep raising will usually return a satisfactory profit independent of the price of wool, as it has been demonstrated that the cost of producing a pound of mutton from good mutton sheep does not exceed that of producing a pound of beef. Practical feeders have found that surplus grain may be fed with profit, and the number of sheep in the grain-producing States seems to be increasing. Corn (see MAIZE) is one of the cheapest grain rations for lambs. It is often fed in a mixture with oats or peas, and, for fattening, a little oil cake added. Various green crops, especially rape (q.v.), are grown for sheep pasture, the sheep being hurdled upon the fields and a rotation of green crops provided. Roots are extensively used, especially in England and parts of the United States where corn cannot be grown. Corn silage is equal in feeding value to roots and is much cheaper. A ration composed of shelled corn, clover hay, and corn silage has generally been found to be the most economical for fattening purposes. See SILAGE.

Hothouse lambs are those that are dropped out of the regular season and fed to meet a special market, the fancy Christmas, and winter trade. Not all ewes can be made to lamb in the fall, the Dorset and Tunis breeds being best adapted for this purpose.

The sheep in the principal countries of the world are, approximately, as follows: United

States, 49,000,000; Argentina, 80,000,000; Uruguay, 26,000,000; Austria-Hungary, 16,000,000; France, 16,000,000; Italy, 11,000,000; Russia in Europe, 46,000,000; Spain, 16,000,000; Turkey in Europe, 21,000,000; England, 17,000,000; Russia in Asia, 24,000,000; Turkey in Asia, 45,000,000; South Africa, 30,000,000.

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