

DOMESTIC MAMMALS

By E. LAURENCE PALMER

"MAN doth not live by bread only". Among other things necessary for a balanced diet and a happy existence are meats, milk, butter, clothing, companionship, relief from too heavy labor, and knowledge and materials for fighting disease. All of these, and more, are supplied by different domestic mammals. It is highly appropriate that one number of this series be concerned with a recognition of the kind of service that different mammals have rendered to man. The merits of certain of these animals have been extolled in *Black Beauty* and *Beautiful Joe*. Ernest Harold Baynes, at the time of his death, was developing a series dealing with unique services of different kinds of mammals to man. Whether we consider the outcast who gets sympathy from his cur dog, the messenger who brings help because of the running ability of his horse, or the doctor who saves thousands of human lives by studying the effect of diseases on white rats, guinea pigs or monkeys, our debt to the faithful domestic animals is great. Many of them have been so bred by man that they could no longer exist independently. They deserve to be better understood.

Domestic Mammals and Labor

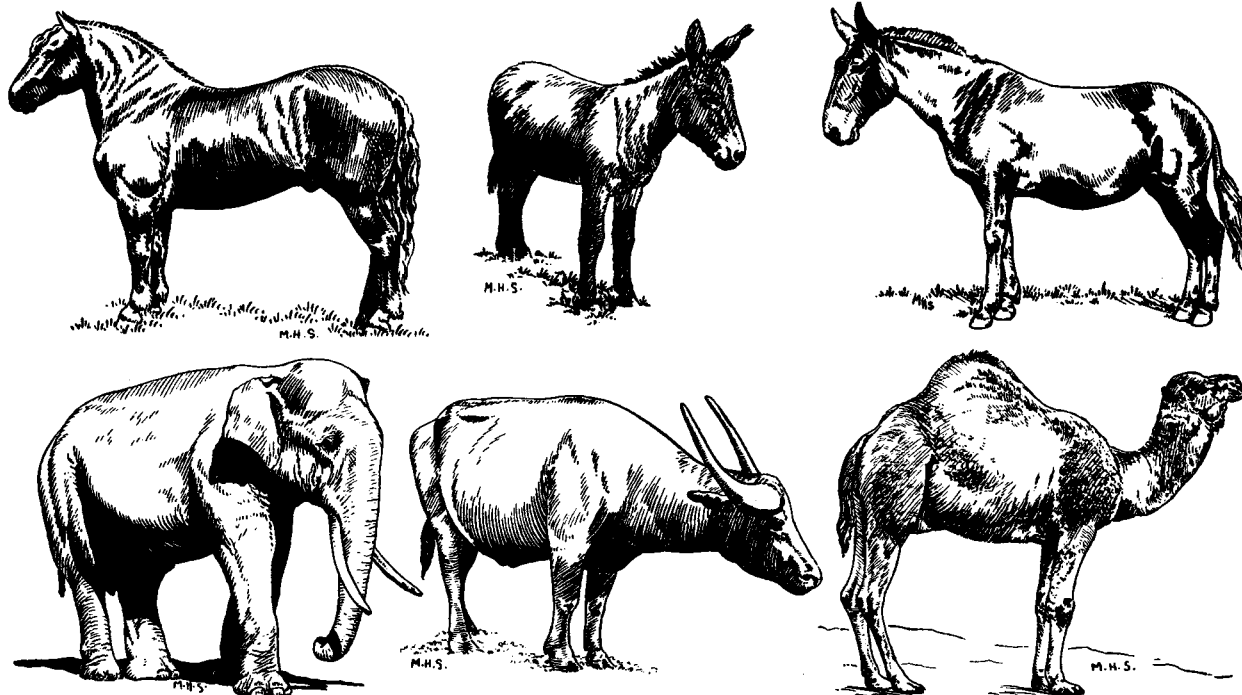
Gasoline engines may drive domestic animals from our thoroughfares and from some of our cultivated fields, but as long as man lives many will go afield on horseback and delight in the companionship of the dog. The airplane may

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soar spectacularly over ice-covered wastes and rocky mountain trails, but dogs will still be used for drawing sledges, and mules and burros will climb the mountains where the

modern machines cannot go. Where there is wet soft soil that must be cultivated for the growing of rice the water buffalo will long wallow to his own pleasure and his master's profit. Camels will do much of the work on the drier sandy wastes, as will yaks in the cold mountains of Asia, while in southern Asia elephants will be "pilin' teak in the smudgy sjudgy creek" in some places, even though tractors are displacing many of them elsewhere. Equipoise, the horse believed to have run the fastest mile on record, died August 4, 1938, but there is every reason to believe that eventually his record of 1 minute and 34 $\frac{2}{5}$ seconds will be beaten.

It has not been many years since most farms had treadmills on which bulls, horses or large dogs were put to work to supply power for threshing, churning, or other types of farm work. By careful selection, animals superior in the desired qualities to those that preceded them have been produced. America was explored and settled by draft animals, while the ancients who built the pyramids probably used human labor. Even today in the Orient human labor supplies much that elsewhere comes from domestic mammals and machines. No matter how far we may get from these earlier practices, it is probable that much of our lubricating oil and most of the cup greases that keep our machines running efficiently will come from domestic



mammal sources. Leather from the hides of domestic mammals formerly delivered power in most factories. But man himself, through his scientists and engineers, has learned to pass much of the burden from flesh to the inanimate.

Domestic Mammals and the Food Problem

There would be no problem of overproduction of agricultural products if man were compelled to get his whole food supply without any assistance from other animals, including men. The problems of leisure and unemployment would not exist, because everyone would be obliged to labor most of the time and would have no leisure. Had not man used his head to solve his own problems we would have none of the following things:

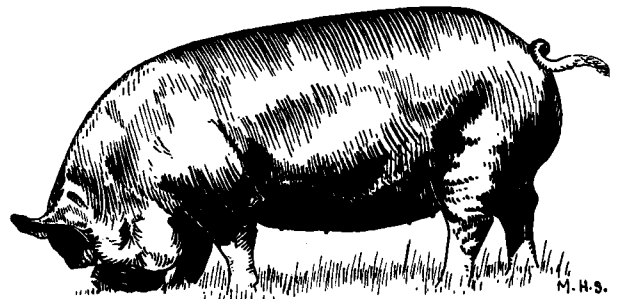
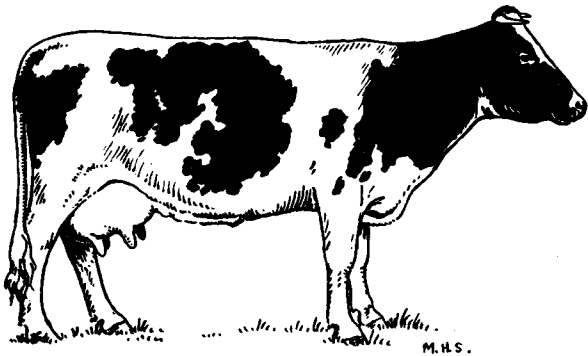
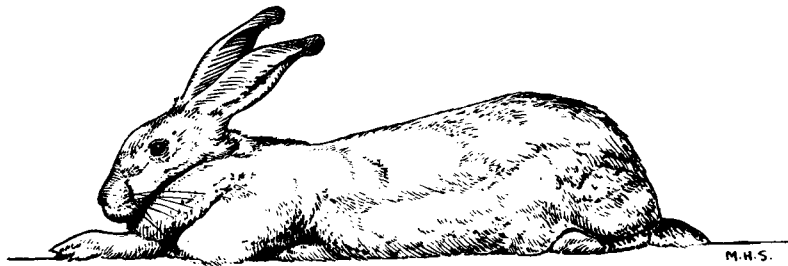
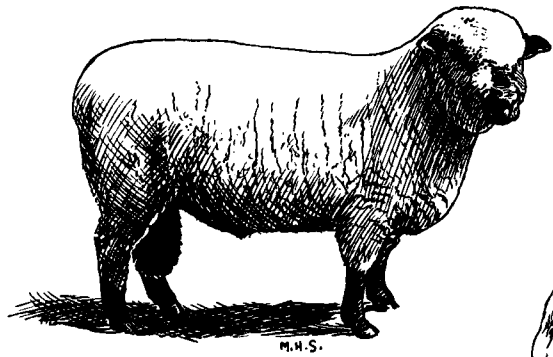
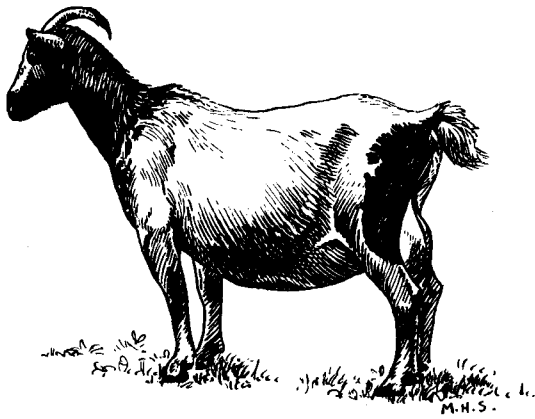
Jersey cows producing milk of five percent milk fat at 20,616 pounds a year; good average Ayrshire cattle producing 7000 pounds of milk of four percent milk fat a year; Aberdeen Angus cattle, whose carcasses are 65 percent merchantable materials with the fat evenly distributed through the lean; Hereford cattle that can produce valuable flesh on relatively poor forage; Shorthorn cattle whose carcasses and milk production make them among the most popular dual-purpose cattle; breeds of swine that may

produce lard, bacon, hams, or all three, economically; sheep whose lambs grow so rapidly that in three or four months they may weigh up to 90 pounds; goats that may produce milk at from two to eight quarts a day with small pasturage requirements; dogs that make it possible for man to herd enormous flocks of sheep and goats with a minimum of labor on his own part. In this, man owes something to his own intelligence in training the dog to help in raising the food supply.

Not so much intelligence has always been shown in the solution of problems associated with man's dealing with members of his own species. We have learned how to raise pigs, but not how to market them with profit to the pig raiser and at a retail price within the reach of many.

Men have unjustified prejudices about using some animals for food. Rabbits are eaten as chicken by people who profess they cannot eat rabbit. Muskrat is reported to be splendid food, but the carcasses are rarely eaten. Some people think that the flesh from red cattle is superior.

It is fun to map the world on the basis of the foods men get from domestic animals. In some parts, the milk must be soured before it is accepted. In some, the milk commonly used comes from cattle; elsewhere from goats, sheep, mares, yaks, camels, llamas and so on, and from each of these kinds of milk, cheeses of different properties



are produced. Fermented milks, such as have been used for generations in Russia, Turkey, Rumania and the Balkans, in recent years have been found to have therapeutic properties not formerly recognized. Such inventions as the Babcock tester, which makes it possible to learn whether a cow is earning her feed, and to set certain standards of quality for milk sold in the open market, have gone a long way in teaching us how to produce almost any kind of animal food product efficiently even though we may not know how to market it fairly.

Some Unusual Uses of Domestic Mammals

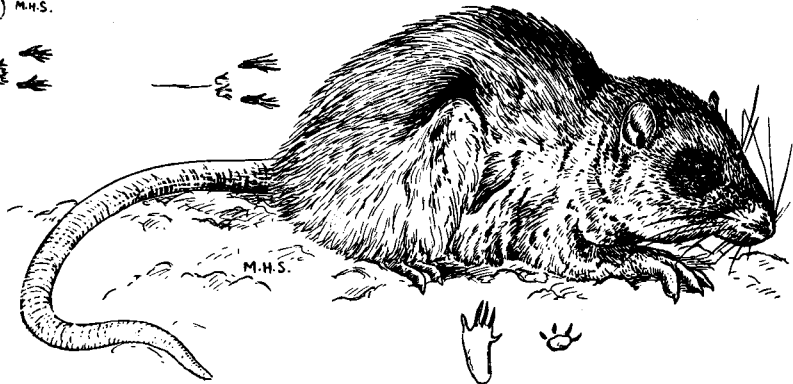
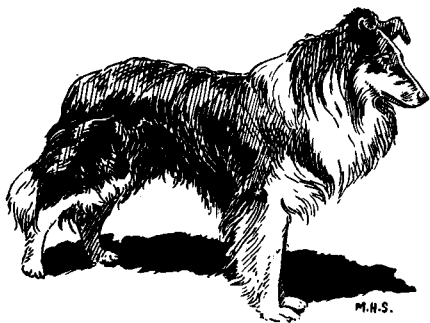
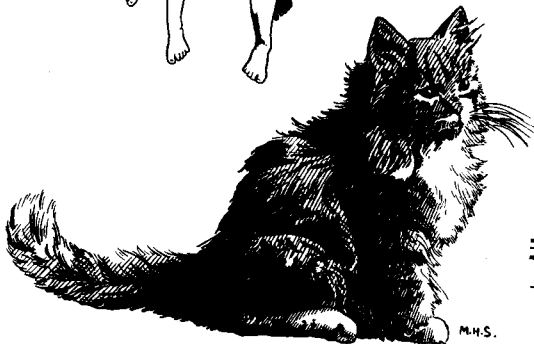
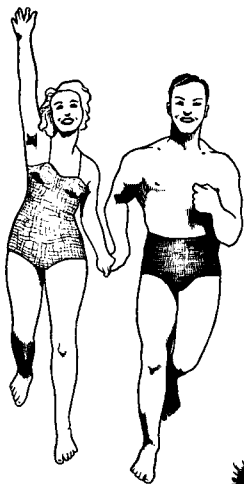
A friend of the writer is busily engaged trying to raise fifteen pounds of cockroaches on diets that have or lack certain vitamins. When he has a sufficient supply he will feed these to rats to determine whether the diets of the cockroaches may affect the development and health of the rats that eat them. This may sound a bit strange but most of the important progress made in dietetics and disease in recent years have been based on experiments with animals other than man himself.

We have found that in many respects monkeys, rabbits, dogs, guinea pigs and rats behave as do men. Some object to the use of these animals in the solutions of men's prob-

lems. Greater still is the number of people whose lives have been saved from the plague, smallpox, rabies, pellagra, tularemia, diabetes and other diseases because of experimental work with these animals. There is every reason to believe that, given freedom from the economic drain of war, we may, in the relatively near future, be able to understand better how to control such scourges as spinal meningitis, rheumatic fever and even the common cold, which so seriously interferes with the enjoyment of our lives to the utmost. To the dumb animals who have helped us in understanding ourselves we owe a debt of gratitude.

Less spectacular are many of the commonplace uses made of various parts of domestic animals killed primarily for food. We do not eat the bones, the entrails, the blood, or many other parts of animals, but we use them in other ways. A string quartet appeals to our esthetic sense. Its music is produced by drawing some hairs over the stretched entrails of domestic animals. We look at a great dirigible, yet may not realize that it is essentially great bags of animal tissue surrounding some gas that is lighter than air.

A piece of cheese flipped at a workman during the noon hour missed its mark but landed in a vat in which materials were being mixed to (Continued on page 572)



COMMON NAME SCIENTIFIC NAME	PERCHERON HORSE <i>Equus caballus</i>	BURRO OR DONKEY <i>Equus asinus</i>	MULE <i>Equus asinus x E. caballus</i>	CAMEL <i>Camelus dromedarius</i>
DESCRIPTION	Reaches a maximum of 17 hands or 68 inches high at withers. Short-legged, compact forms are popular. Feet, large and not long-haired. Chest, deep and broad. Back, short. Loins, smooth and well-muscled. Color, may be gray, chestnut, roan or brown, but black and gray are most popular.	Varies in height from 30 inches to that of a good-sized horse. Ears, long. Tail, sparsely haired. Eyes, deep-set. Body, generally not so heavily- or smoothly-muscled as that of a horse. Mane, wavy, uneven, coarse. Legs, medium in length. Feet, smaller. White to black, commonly with white nose, belly and flanks.	A draft mule weighs about 1200 pounds; is about 16 hands (16x4 or 64 inches) high at withers; farm mule, 1100 pounds, 15½ hands; mining mule, 600 to 1300 pounds, 12 to 16 hands. Mules retain the long ears, small feet, sparse tail and bray of the jack-ass father, but those like mother are most valuable.	Arabian camel, with one hump; Bactrian, with 2 humps on back. The former, a little the larger, is 6 to 7 feet tall at shoulder. Long neck and legs. Feet, two-toed, soles being undivided and the hoofs on the upper surface. Hair, soft and unevenly placed, longest on head, neck, shoulders, hump and thighs.
RELATIONSHIP AND DISTRIBUTION	Family Equidae of the Ungulata. This breed developed in the Perche district of France and was associated with the fortunes of the Crusaders. Became popular in America during Civil War times. Domestic horses developed from wild horse of Asia, a descendant of the <i>Eobippus</i> , which was about the size of a collie dog.	Family Equidae of the Ungulata. The jacks of France are probably the largest; those of western India and Ceylon, the smallest. Asses are found wild in Africa and Asia. Various breeds were brought to America with the Spanish explorers. Important breeds: Andalusian, medium-sized; Maltese, small; Majorca, large; Poitou, very large.	Hybrid of certain Equidae in the Ungulata. The animals are used the world over for a variety of tasks. In the United States about 90 percent of the mules are in the South on farms, and they are, in general, more common in the warmer parts of the earth. Probably have been produced ever since horses and asses were domesticated.	Family Camelidae of Ungulata. Arabian camel used in both Africa and Asia, and Bactrian camel used in China, Mongolia and eastern and central Asia generally. Arabian camel introduced rather unsatisfactorily in southern Europe, southwestern United States and in Australia. The Bactrian not so widely used.
LIFE HISTORY	A mature, male <i>stallion</i> mates with a mature, female <i>mare</i> . In 11 to 12 months one or two <i>foals</i> are born. These, when weaned, become <i>weanlings</i> . A male, castrated when young, is a <i>gelding</i> ; one castrated when mature is a <i>stag</i> . A <i>filly</i> is a young female; a <i>colt</i> , a young male. A young Percheron may weigh as much as one ton when 2 or 3 years old.	The male is known as a <i>jack</i> ; the female, as a <i>jennet</i> . Some are known as donkeys. The American Breeders Association of Jacks and Jennets was organized in 1908 and has done much to improve our animals, which, in this country, are used almost solely in the production of mules. For this purpose, large animals are generally to be desired.	A <i>mule</i> is the result of mating of a male ass and a female horse. A cross between a female ass and a stallion, or male horse, is a <i>hinny</i> . Hinnies are supposed to lack some of the good qualities of a mule, but this prejudice may not be justified. They are born about a year after the parents mate. Reports of female mules bearing young are not well supported, and with some it would be impossible.	A single calf is born at a time; is suckled at least 12 months by the mother. During first year, young may be carried in nets during forced marches. Young do not reach maturity until at least five years old. They will be commercially valuable until 25 years old and may live until 40 years old. Milk is thick, rich and considered by some superior to cow's milk. Breeds every 2 years.
FOOD AND OTHER HABITS	Patient, powerful, kindly animals with good memories. Young horses should grow steadily during first two years. Oats popular as grain food because hull lends bulk and prevents gorging. Timothy hay generally better than legume hay. After working, horses should be given a small drink; then, when rested, should be watered again and then fed.	The animals have food habits similar to those discussed under "mule". They are more patient and hardy than horses or mules, travel slowly but cautiously and safely over difficult territory, and are able to get subsistence from fields that would not support most other draft animals.	Mules' food is much the same as that of horses. They are not inclined to eat much when heated or tired, but must have ample food to consume during periods of rest. Probably mules were brought to America as early as the Sixteenth Century by Spaniards. They are almost always patient, hardy, capable animals, lacking nervous qualities of their mothers but possessing their strength.	Food is vegetation, either herbs or woody plants. Some green, succulent material necessary for continued health. Can store water in stomach, but in hot weather must renew supply at end of three days. Reserve food stored as flesh on hump, this area becoming thinner as animals are starved. Camels are stupid, occasionally vicious, but generally obedient to will of man.
USE TO MAN	Horses in United States dropped from 16,000,000 in 1925, to 12,000,000 in 1935, to 11,000,000 in 1938. Of draft horses Percherons outnumber any other breed 7 to 1. They are quick and powerful, popular as war horses, in agriculture and for short-haul work. Other breeds are useful in other situations, from racing to doing tricks. Some used for producing serums against disease.	The burro used in southwestern United States, Mexico and elsewhere may be no larger than a Shetland pony but can carry a load of 250 pounds over rough trails. Domestic asses were developed from African wild ass. In Arabia, the flesh of wild asses is eaten regularly. The domestic animals are frequently used as pets.	Mules make ideal army draft animals. In war times may sell for \$500. Before Italy's conquest of Ethiopia American mules were bought so freely that our supply was very low. Since a mule cannot be put at hard labor under 5 years from time the parents mate, and many until 8 years, their production preceding times of war may be highly profitable. 4,477,000 U. S. mules in 1938.	May carry load of 400 to 600 pounds three miles an hour up to 10 hours a day; faster animals may carry light loads nearly 100 miles in 10 hours. Milk is used as food; curdles when put into tea or coffee. Flesh resembles beef when boiled or roasted. Hide makes excellent leather. Hair is made into cloth, although "camel's hair" is commonly goat hair. The dung is useful as fuel in deserts.

ELEPHANT <i>Elephas indicus</i>	WATER BUFFALO <i>Bos bubalus</i>	HOLSTEIN FRIESIAN CATTLE <i>Bos taurus</i>	GOAT <i>Capra hircus</i> and <i>C. angorensis</i>	LLAMA <i>Lama peruana</i>
<p>Indian elephant is smaller, has smaller ears and is more easily tamed than the African elephant. Males larger than females, weighing up to five tons. Skin is tough and may be an inch thick, is almost hairless except near tip of tail and is generally well wrinkled.</p>	<p>Height at shoulder, 5 to 5½ feet; horns, 8 to 12 feet from tip to tip along the curve and backward-pointing as contrasting with the forward-pointing horns of <i>Cape buffalo</i>. Length, 9 to 10 feet from nose to tip of 2-foot tail. Color, gray to black with the legs distinctly lighter. Horns of cows slenderer than bulls'.</p>	<p>Bulls weigh one ton or more, with heavy-framed, lean bodies. Necks, muscular. Horns, incurving. Cows, smaller, with more slender necks, large bodies and large udders; mild; weight, average 1,200 pounds. Color, black and white, blotched, although there may be red animals. Largest dairy cattle.</p>	<p>Hollow-horned animals. Angoras weigh 60 to 100 pounds. Males, with 18- to 20-inch horns, and does, 8- to 10-inch horns. Milch goats smaller and often hornless, with bodies proportionately longer and hind parts larger. Angoras, long-haired; milch, short-haired. Bucks larger than does.</p>	<p>Length, 4 feet. Tail, ½ foot. Height, 3 feet. Neck, nearly 2 feet. Body, broad. Legs, thin. Toenails, sharp talons. Hair, thick, soft and shorter on head and ears. Color, commonly white or brown. The alpaca is larger but slighter, longer-haired and with a smaller head.</p>
<p>Family Elephantidae of Proboscidea of the Ungulata. Forefoot of African, usually 4-toed; hind, 3-toed; of Indian, 5 and 4. Indian or Asian elephant is found through southern Asia, the Malay Peninsula, Ceylon and Sumatra. The African ranges south of the Sahara through the wilder parts of central Africa.</p>	<p>Family Bovidae of the Ungulata. The domesticated water buffalo is an Indian buffalo native of India, Ceylon, the Philippines and the Malay Peninsula. The Cape buffalo ranges in eastern Africa. Both are water lovers, spending much time nearly submerged in it, particularly in grassy swamps near the sea.</p>	<p>Ungulates of Family Bovidae. Holsteins developed in Holland and Friesland and generally used over prosperous lowlands of Europe. Introduced into America about 1795, and, through unwise crossing, depreciated. Later importations brought quality up, and now high grade herds are common in most dairy country.</p>	<p>Ungulates of the Family Bovidae. The domestic goat is probably derived from the Persian wild goat of the mountains of Asia Minor. Other kinds include the long-haired Angora; the Cashmere goat of Tibet (2 feet high); the long-eared, black-haired Syrian goat of Europe; the small Sudan goat; and the Egyptian goat.</p>	<p>Family Camelidae of the Ungulata. The llama and alpaca are derived from the wild <i>guanaco</i>. The llama is found in Peru, Bolivia and west coast of South America. In temperate climates like cooler Patagonia they come down to the sea, but in equatorial regions are found in Andes from 12,000 to 16,000 feet elevation.</p>
<p>One young born some 21 months after the mating. Baby weighs about 200 pounds and stands about 3 feet high when born. Jumbo, at 26 years of age stood 11 feet 2 inches at shoulder, weighed 6½ tons and probably had not completed his growth. In the wild, elephants live together in herds of up to 50 or more, with one or more old males providing a degree of protection. May possibly live to 150 years of age.</p>	<p>Generally two young are born to the water buffalo and the normal life is about 10 years, although under suitable conditions it may live an active life longer. The related Cape buffalo breeds in summer and the cow leaves the herd for some days or weeks when her young are born. Water buffaloes will not cross with domestic cattle.</p>	<p>Nine months after cows and bulls mate <i>calves</i> are born. Second year, these are <i>yearlings</i>. Immature females are <i>heifers</i>; immature males, <i>yearling bulls</i>. <i>Steers</i>, castrated, immature males; <i>oxen</i>, castrated, mature males. At 18 months, first pair of permanent incisors appear; second pair, at 27 months; third pair, at 36 months and fourth pair, at forty-five months. Cow may breed when from 1½ to 12 years of age.</p>	<p>Young <i>kids</i> are born from 147 to 155 days after the male, or <i>buck</i>, mates with the <i>doe</i>, or nannygoat. The two to four young are well developed at birth, can follow mothers in 4 to 5 days, mature in one year, are old at six years, but may live to 15 years of age. Kids not reared are slaughtered and sold as venison. Does may give milk for six months.</p>	<p>Llamas breed every two years. Young males are driven from herd by females, while older males fight each other for leadership. Mate in November and young (one) are born in May or June with conspicuously thin necks, bodies and legs. Llamas mate with alpacas but offspring are sterile. In captivity, llamas may live 12 to 14 years.</p>
<p>Food is vegetation, a herd of 100 animals requiring about 40 tons of fodder in a day. They also require much water and enjoy bathing, although the African elephants enjoy the hot sun. They may sleep either standing or lying down, and when travelling may make about 15 miles an hour by a sure-footed, rolling gait. They never canter, trot or gallop. They have many insect and parasitic enemies.</p>	<p>Food is mainly the grasses, such as hay or grain. The animals in wild or domestic state may be dangerous, although a trained animal may be handled safely by a familiar child. Stories of their courage, cunning, vengeance and strength are generally well supported by the facts. Apparently well domesticated animals may go wild on occasion and revert to a docile state just as quickly. Must have water.</p>	<p>Cattle were domesticated from wild cattle, which, until the Fifteenth Century, roamed the forests of Europe; when they were domesticated is lost in history. Common American breeds of cattle include, of the dairy type, the Jerseys, Guernseys, Ayrshires and Holsteins; of the beef types, the Aberdeen Angus, and Hereford; and of the dual purpose type, the Short-horn and Swiss.</p>	<p>Food is almost any vegetation. Animals destructive to forests, have keen senses of sight and smell, are wary, restless, and delight in climbing to highest available elevation. Are exceptionally sure-footed. Make good pets, but the bucks in particular produce an unpleasant odor. One-year goat, 2 broad, front teeth, lower jaw; 2-year, 4; 3-year, 6.</p>	<p>Food is coarse vegetation including shrubs, lichens, mosses and grasses. If food is succulent, they do not drink. They live in large herds; are more intelligent than camels. Expel stomach contents in face of offender. Most of them are gentle and may be ridden or driven by children. Must have cool or cold climate to thrive at all well.</p>
<p>Indian elephant, possibly most intelligent of domestic mammals, capable of being trained to do intricate tasks. "Rogues" may do great damage to crops; may even kill men. Natives relish the flesh, the trunk and foot being preferred. The hide makes good leather. The animals formerly were all-important in war in certain areas. Tusks, most valuable source of ivory.</p>	<p>Probably the most useful draft animals where rice is raised and therefore common in southern Asia and in Oriental countries. In some regions, the chief source of milk and butter as well. The flesh is stronger, tougher and muskier than that of cattle; the calf flesh is much like pork. The hide makes a superior quality of leather and the horns are useful.</p>	<p>In 1938 there were in America about 25,000,000 milk cows, worth \$1,355,926,000; about 41,000,000 other cattle, valued at about \$1,100,000,000, or roughly about one-eleventh of the cattle population of the world. Some 80 Holstein cows have records of more than 1000 pounds of milk fat a year. One cow one year produced an average of more than 90 pounds of milk a day.</p>	<p>Milch goats must be milked thrice daily giving 2 to 8 quarts of rather strong but nutritious milk; kept by 75 percent of German families. Hides produce morocco leather or parchment. Angora goats produce fleeces weighing 3 to 5 pounds of 8-inch hair which is made into mohair cloth. Animals are sheared twice a year in the South and once in the North.</p>	<p>Valuable for fleece, although males have been used as beasts of burden, each carrying about 100 pounds. The alpaca has the superior fleece, producing 11 to 15 pounds when sheared every other year. Flesh of young llamas is tender, but that of older animals is too tough except for drying. Efforts to establish them in Australia and Europe have failed.</p>

COMMON NAME SCIENTIFIC NAME	BERKSHIRE SWINE <i>Sus scrofa</i>	SHEEP <i>Ovis aries</i>	DOMESTIC RABBIT <i>Lepus cuniculus</i>	GUINEA PIG <i>Cavia cobaya</i>
DESCRIPTION	Medium-sized, rarely more than 900 pounds in weight. Body, long with good depth and medium width. Snout, short and upturned. Ears, erect. Color, black with white markings, with 6 white marks becoming fixed as standard of perfection. Berkshires, black and white; Yorkshires, white; Duroc-Jerseys, red.	Southdown breed (mutton), weigh up to 190 pounds; Merino (fine wool), up to 140 pounds, and Shropshire (general purpose), to 250 pounds. In all cases, the ewes are about 1/3 less in weight, are less aggressive but both produce commercial wool proportional to weight.	Wild European rabbit from which domestic rabbit is derived may weigh from 7 to 12 pounds, although domesticated Dutch rabbits may be as small as 1 1/4 pounds. While wild rabbit has erect ears, domesticated forms with 23-inch lop ears are bred. Fore feet, 5-toed; hind feet, 4-toed. Upper incisors, 4.	About 10 inches long. Weight, about one pound with stout, heavy bodies. Legs and tail, short. Front feet, 4-toed. Hind feet, 3-toed to 5-toed with large, angular nails. Fur of wild animals, coarse, rather long, and usually grayish brown. When hungry, gives grunting sounds like pig.
RELATIONSHIP AND DISTRIBUTION	Ungulates of Family Suidae. Hogs have probably been domesticated some 4000 years, and they have existed on the earth possibly 6 million years. Berkshires were developed in England by crossing English with Chinese and Siamese hogs. Introduced into America about 1823. Generally popular, particularly in Canada.	Ungulates of the Family Bovidae. The Southdown originated some 200 years ago in eastern England; the Merino, in Spain some 2000 years ago; and the Shropshire, in western England about 1850. Merino is probably the commonest sheep in America and is most popular in the West.	Rodents (Lagomorphs, recent authors). The Belgian "hare" is a true rabbit while the cottontail rabbit is a true hare, the former commonly burrowing while the latter does not. Except for dog, no other mammal has probably developed more variations under domestication than the rabbit. Found domesticated in most parts of the world.	Rodents, classified between the mice and rabbits with some 20 wild species and many more domesticated varieties. Although there are varieties, named English, Peruvian, Angora, Abyssinian, and others, the animals undoubtedly originated in South America, "Guinea" being a corrupted Guiana.
LIFE HISTORY	Newly-born swine are pigs. When weaned, they are <i>sboars</i> . Young female, a <i>gilt</i> ; mature female, a <i>sow</i> . Mature males, <i>boars</i> ; castrated males, <i>barrows</i> . Sows a year old may be bred and 112 days after mating young are born. Older sows may produce two litters a year. Mother may be separated from young in 10 to 12 weeks.	One active <i>ram</i> (male) not less than 1 year old is bred to from 35 to 50 <i>ewes</i> (females) not less than 1 1/2 years old, and in 146 days young (lambs), often twins, are dropped. Ewe needs 16 square feet of floor space to care for young which nurse in 2 hours. Lambs at 2 weeks begin to nibble hay; marketable at 4 to 6 months. <i>Wethers</i> are castrated rams.	After mating of the female, or <i>doe</i> , and the male, or <i>buck</i> , the young are born in from 30 to 32 days in litters of 4 to 12 or more, the young remaining blind for a number of days, being cared for splendidly by mother. May have 6 to 8 litters a year. Families stay together, many families often living together in harmony.	While wild guinea pigs breed but twice a year, domesticated varieties may breed every two months after maturity and mature in three to five months after birth. Young born 61 to 63 days after the mating and at birth have open eyes, fully developed hair; may run about a few hours after birth. Litters of from 4 to 12 or more though wild animals average 1 to 2.
FOOD AND OTHER HABITS	Pigs are not naturally unclean but feed on roots and underground plant parts naturally. Also eat insects and small animals on occasion. Swine have a good sense of hearing and of sight if properly cared for. These senses may be poorly developed if food is improper. Legume hay is highly recommended, particularly in winter. Since stomachs hold about 8 quarts, hogs must eat frequently.	Food is vegetation cropped close to the ground. Best if contains clover. Sheltered sheep are fed legume hay and grain mixture of corn, 4 parts; oats, 4 parts; linseed or cottonseed cake, 2 parts by weight. Salt should always be available. Pregnant ewes require about 1 to 2 pounds of silage, 1/2 to 1 pound of straw and 3 pounds of corn stover.	Easily cared for if given dry quarters with water available, a place to burrow and an abundance of food. Food, mostly vegetation, but may eat flesh in captivity. Generally feed at night, or when light is not strong. Individuals may warn others of danger by thumping ground with hind feet. Hares do not normally care for young so well as do the rabbits.	Live on vegetation only in wild, feeding usually when sunlight is dull. Never bite. Have an unpleasant odor but make gentle and popular pets. Cannot stand low temperatures. Young, independent of mother after about three weeks. Wild animals burrow in sand or prefer living in vegetation-covered marshy areas.
USE TO MAN	In 1938, there were 44,418,000 hogs in the United States worth nearly half a billion dollars. Berkshire hogs rank fifth in popularity in the United States and second in Canada, but for bacon, hams and shoulders they lead. Duroc-Jersey and Chester White are important lard producers and Yorkshire is a superior bacon type.	1938 U.S. population, 53,000,000, worth about \$324,000,000; number greater but value less than with hogs. Southdown ram's fleece may reach 10 to 12 pounds; Merino ram's, 30 pounds of finest quality; Shropshires average 10 pounds of good quality. Ewe's fleece weighs less. Milk used to make Roquefort cheese. Hides made into leather; flesh, mutton or lamb. Southdown lamb may weigh to 90 pounds in 3 to 4 months.	Bred for hair, flesh, genetic studies, medical experimentation, hides and pleasure. Angoras may have hair 7 inches long while silver-grays have short, thick, chinchilla-like fur. Cheaper fur coats—"lapins"—are rabbit; while they lack durability of many wild fur-bearers they serve well for their cost. Belgian hares are efficient flesh producers; probably greatest service is in medicine.	Were domesticated and raised for food by Incas of Peru before Europeans came. Now bred for studies in heredity and in medicine for the production of serums, for the isolation and production of disease-producing organisms and as pets. Their important contribution to modern society is unquestionably in connection with medical research. Popular with certain groups of fanciers.

RAT <i>Rattus norvegicus</i>	COLLIE DOG <i>Canis familiaris</i>	CAT <i>Felis domestica</i>	MONKEY	MAN <i>Homo sapiens</i>
<p>Body length of year-old animal, about 9 inches; weight, about ½ pound. Norway rat, brown. Black rat, smaller and darker. Albino or white rats are almost entirely white forms of the Norway rat, although albino black rats are known. The white rat of the laboratory is a relatively harmless animal.</p>	<p>Collies stand about 20 to 24 inches high; weigh 40 to 60 pounds. Hair, long and fine. Nose, long and slender. Ears, droop or are erect. Color, black and tan, or rich brown, or white with bluish-gray cast. Graceful, dainty and highly intelligent. Pupils of eyes, round.</p>	<p>Length, normally about 2½ feet, of which about ⅓ is tail. Sharp, curved retractile claws. Footprints almost round and showing hind foot superimposed on track of front foot alternating and up to 9 inches apart. Fur, varying greatly.</p>	<p>South American (Cebidae), small, thumb and big toe opposable; nostrils, widely separated; toes and fingers, nailed; tail, prehensile. Old World (Cercopithecidae) usually all limbs about equal length; tail, usually long, never prehensile. Thick patches on seat. Nostrils, close together.</p>	<p>Average weight, between 100 and 200 pounds. Usual height, up to 6 feet. Walks erect on hind legs. Has mentality greater than other animals. Important races, the white or Caucasian, the black or Ethiopian; the brown, or Malay; the red, or Indian, and the yellow, or Oriental.</p>
<p>Rodents. Established in China, Japan, India, western Europe, North America and elsewhere. Came into Europe in Eighteenth Century, to England about 1729; Prussia, 1750; Paris, 1792; United States, about 1775, following house rat into Europe by about 600 years. Did not originate in Norway.</p>	<p>Order Carnivora. Family Canidae. Collies were developed primarily as sheep dogs until recently when they have been used more as companions. In sheep raising in England, Scotland and Wales, the animals are indispensable. Collies vary greatly in different parts of the world.</p>	<p>Carnivora. Family Felidae. European, tabbies or tortoise-shell; latter, usually female. Manx, long hind quarters, little or no tail. Asian, Persian or Angora, long silky fur. Siamese, fawn color, black head and legs, blue eyes. Chinese, long silky ears. African, stiff, wiry hair, Paraguay, short, close, scanty hair.</p>	<p>Order Primates which also includes the Homiidae (men) and the Simiidae (apes). The Cebidae are arboreal. The Cercopithecidae include the rhesus and other Indian monkeys, the tailless Barbary ape, which is found on the Rock of Gibraltar, and the African monkeys. In the apes, the forelegs are longer than the hind, and tail is absent.</p>	<p>Family Hominidae of the Primates. Probably developed in the Eastern Hemisphere and spread from there to all parts of the earth that was capable of being modified to provide the necessities of life for the species. Probably appeared in Pleistocene times as Java ape man about 950,000 B. C.</p>
<p>Mate any time of year, and 22 days later about 6 blind, naked, helpless young are born. Ears open in 3 days, eyes, 14-17; sexually mature in 2 months; double weight six days after birth; cease reproducing at 18 months; may live to old age of 3 years. In wild state, may produce 6 or more litters annually. Live about 30 times as fast as man.</p>	<p>Since wolves, jackals, coyotes and dingos mate freely with dogs they are obviously closely related. After the male <i>dog</i> mates with the female, or <i>bitch</i>, the puppies are born in from 59 to 63 days. The <i>pups</i> are blind until from 10 to 12 days and are more or less helpless. The life of a dog is from 10 to 15, or occasionally 20 years. Normally, senses of hearing and smell are acute.</p>	<p><i>Kittens</i> are blind and relatively helpless at birth and are born about 63 days after the mother is mated. They are cared for and defended by the mother. Iris of eyes of adults usually yellow; of kittens, often blue or green. Males commonly larger than the females.</p>	<p>In monkeys, the period from generation to generation is never less than 3 years and in apes probably never less than 12 years. Apes approximate development of man through infancy, adolescence, maturity and old age but in all of these monkeys follow a shorter cycle as illustrated by the maturity ages of 3 years in the more precocious monkeys to 12 years in apes.</p>	<p>Young, born nine months after mating of parents, more or less helpless at first and through period of infancy of one year. Childhood and adolescence follow, when greatest growth takes place. Girls mature earlier than boys throughout most of life but may live as long. Physical decline may not begin until after 70. Senility may be delayed until end.</p>
<p>Food, almost any organic substance. Will attack humans and have killed pigs and calves. Respond to diets much as do men and will work in union to get food. Subject to many of diseases of man and a carrier of bubonic and pneumonic plagues, trichinosis in swine and tuberculosis in poultry. Black rat survives cooler climate than the Norway rat and is less aggressive.</p>	<p>Food, normally animal matter. This they catch by pursuit and kill by biting. Uneaten surpluses are hidden for use later. Dogs are not so careful about what they eat or drink as are cats or horses. Graceful, intelligent animals, although prize-winning show dogs are not always the most brilliant mentally. In Bible times, the dog was looked upon as unclean, but some ate them.</p>	<p>Food, principally animals caught by surprise and a sudden dash; killed by piercing with long slender teeth while being held by fore-feet. Cats can see with little light. Eyes reflect lights. In strong lights eyes show slender vertical slit. Cats are independent, living essentially selfish lives. Little sense of smell compared with dogs, but excellent sight and hearing.</p>	<p>Food, essentially plant materials but this varies. While gibbons have but single mates, the rhesus or sacred monkeys mate promiscuously. The rhesus monkeys are particularly susceptible to many diseases of man, behaving as does man when having infantile paralysis, for example. Because of this they are valuable experimental animals. In the native India, these are considered sacred.</p>	<p>Food, a variety of organic materials with some mineral substances, most of which may be stored and modified by man to suit his convenience. Intelligence in controlling the causes of his own diseases is possibly most remarkable character as well as his ability to create new materials through use of natural forces. These abilities possible only because of superior reasoning power.</p>
<p>Wild Norway rats destroy about \$200,000,000 worth of agricultural products in United States and \$20,000,000 in Canada annually. Probably our worst pests. Barium carbonate, 1 part to 4, with a soft food is an effective but dangerous poison control. Albino laboratory rat, one of most useful animals in studying disease, ranking well with guinea pigs and monkeys; make superior diet demonstrations.</p>	<p>Collies have been known to herd 3000 sheep, driving rams into one corral, the ewes into a second, and lambs into a third, in spite of habit of sheep to stampede after any leader. Collies have surprising memories. Some develop criminal instincts. Dogs are important messengers and beasts of burden in Arctic regions and under particular circumstances; valuable in medicine as experimental animals.</p>	<p>Long domesticated. In Egypt were considered sacred and at death were embalmed. Are probably loved or hated or merely tolerated by most people, but economically are carriers of hydrophobia and other diseases, and are birds' worst enemies. Destruction of mice probably not commensurate with bird destruction. Should be confined, particularly in nesting season. New York has law designed to curb cats.</p>	<p>Rhesus monkey, worth from 8 to 25 dollars as experimental animal in studying disease. Colony of 500 animals established on a 36-acre island off Puerto Rico. At Orange Park, Florida, Yale and the Rockefeller Foundation maintain an Anthropoid Station for studying primate biology. A fund of \$189,000 has been set aside to maintain this station from 1939 to 1944.</p>	<p>Uninformed man, a dangerous agent of destruction, as shown by slavery, war, and misuse of natural resources, and even some inventions. Informed and cooperative man has produced great works of art, religion, philosophy, poetry, music, literature, engineering, education and sociology; of these some are made by other species but nothing comparable to that of man. Often a slave to ridiculous prejudices, superstitions and mass judgment.</p>

(Continued from page 567) make phonograph records. The resulting records were superior to those made without the casein the cheese supplied.

Should we attempt to go into the unique uses of animal products we should have to recognize that they supply us with certain kinds of sandpaper. They help harden steel and concrete. They give us gold beater's skins with which we can beat out thin sheets of gold. They provide us with substances with which we can sew wounds together; with dice with which some people lose fortunes. They enter into the making of moving picture films with which fortunes are made. The intestines of lambs are used to string tennis rackets. Properly processed, animal products may make anything from a baby's rattle and a pipe bowl to bindings for books and waterproofing for leathers and fabrics.

Can you recognize the parts of animals used in making orchestral instruments; in making glue used in furniture and in books; in making buttons, shoes, and the host of plastic trinkets that have animal products in them? If not, inquiries in these directions may prove to be exceptionally illuminating.

Domestic Mammals Through the Ages

Mary and her little lamb; the cow that jumped over the moon; the cow with the crumpled horn that tossed the dog that worried the cat; Puss-in-boots; Baby Bunting's rabbit skin; and the pig that was stolen by Tom, the piper's son, are domestic mammal characters known to every child. The GOP elephant, the Democratic donkey and the Prohibition party's camel are well-known symbols to most adults. But how many people know the extent to which many domestic animals are worshipped, even today?

When a person died in ancient Rome, hogs were sacrificed to clear the house of the pollution of the dead body. They were also sacrificed at the conclusion of treaties or agreements, the contracting parties dipping their hands in the blood and then shaking hands. It is possible that contracts so sealed were more fairly adhered to than are some modern contracts negotiated—say those of the Rome-Berlin axis. The idea of sacrificing the hog in ancient Rome was that should the contract be broken the one breaking it would be liable to the same fate as the hog.

In India hogs were sacrificed in the belief that this would provide protection from cholera. Possibly the fact that eating fat meat in warm countries does not produce pleasing results may have justified prejudices against hogs. Plutarch claimed that hogs were disliked by the sun and the moon and that they were responsible for the moon becoming dark at intervals. So resentful have some races of humans been to hogs that persons wearing shoes made of hog skin were not permitted to enter temples. Those who tended hogs were not permitted to marry except with those similarly engaged.

Sheep have had their place in influencing human customs. They were long used as sacrificial animals in spite of the fact that the leader of the Christian religion is often spoken of as the Good Shepherd and is pictured holding a lamb. In Czechoslovakia, Hungary and other countries it

has long been the cruel and certainly senseless custom to throw a ram from the church tower in the autumn to assure a good crop next year. Similar long-distance weather planning provided good weather in the spring in Finland if the gods were satisfied by the killing of a lamb the preceding fall. When one reads of this type of behavior by the human species he must realize that human behavior is not always any more intelligent than that one expects of dumb animals. It is not surprising under these circumstances to find that in Madagascar sheep are treated kindly because they are believed to constitute the residence of one's ancestors and for this reason sheep flesh is not eaten by some people for fear that an ancestor might be served up with the rest of the meal.

The American Indians, often designated as savages by the more enlightened Europeans, often recognized dumb animals as their brothers. They frequently apologized to them for taking their lives and killed only when the animals were needed for food or clothing. When the continent became overrun with a race that considered itself wiser the supply of these useful wild animals waned.

Horses have ranked high in value at most times though possibly none went higher than did Pegasus the flying horse. Shakespeare has King Richard III offering a kingdom for a horse. But man's interest in or curiosity about horses probably reached an all-time high when the people of Troy came out to look over the wooden horse that had been drawn up in front of their gates and thereby lost their city. Since that time horses have made and broken men and nations.

Acknowledgments

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Livestock in Mythology and Religion. Monthly Letter to Animal Husbandmen, volume 9, number 1. Armour's Livestock Bureau, Chicago, Illinois. 1928.

Mankind's Best Friend—Companion of His Solitude, Advance Guard in the Hunt, and Ally of the Trenches. Ernest Harold Baynes. The National Geographic Magazine, volume 35, number 3. Washington, D. C. 1919.

The Story of the Horse. William Harding Carter. The National Geographic Magazine, volume 44, number 5, Washington, D. C. 1923.

By-Products in the Packing Industry. Rudolf A. Clemen. The University of Chicago Press, Chicago, Illinois. 1927.

The Pet Book. Anna Botsford Comstock. The Comstock Publishing Company, Ithaca, New York. 1914.

The Taurine World. Cattle and Their Place in the Human Scheme—Wild Types and Modern Breeds in Many Lands. Alvin Howard Sanders. The National Geographic Magazine, volume 48, number 6. Washington, D. C. 1925.

The Book of Rural Life. Edward Mowbray Tuttle. Bellows-Durham Company, Chicago, Illinois. 1925.