

*W. L. G. Johnston*

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U. S. DEPARTMENT OF AGRICULTURE.

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FARMERS' BULLETIN 330.

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# DEER FARMING IN THE UNITED STATES.

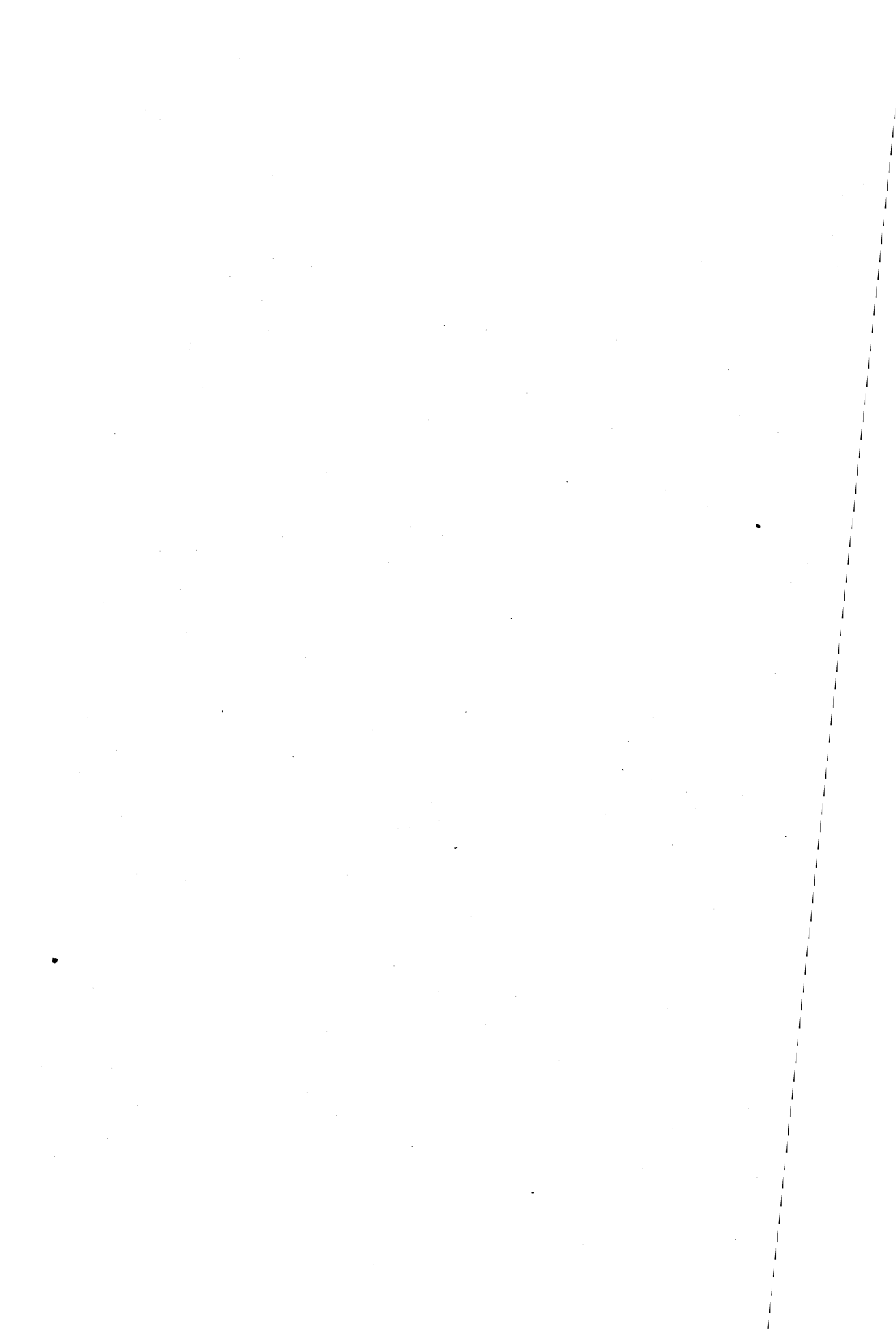
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## CONTENTS.

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	Page.
Introduction.....	5
Importance of the deer family.....	5
The domestication of deer.....	6
Species to be selected for breeding.....	7
The wapiti, or Rocky Mountain elk.....	7
Habits of elk.....	9
Elk venison.....	9
Domestication of elk.....	10
Management of elk in inclosures.....	11
Range.....	12
Food.....	12
Fence.....	12
Cost of stock.....	12
Vicious male elk.....	13
Breeding the Virginia deer.....	13
Experiences of breeders.....	15
Management of Virginia deer.....	17
Wild deer in private game preserves.....	17
Game laws in relation to deer farming.....	18
Summary.....	20

## ILLUSTRATIONS.

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	Page.
Rocky Mountain elk.....	8
Tame herd of Virginia deer.....	14

## LETTER OF TRANSMITTAL.

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U. S. DEPARTMENT OF AGRICULTURE,  
BUREAU OF BIOLOGICAL SURVEY,  
*Washington, D. C., June 3, 1908.*

SIR: I have the honor to transmit the accompanying manuscript on the subject of Deer Farming in the United States, and to recommend its publication as Farmers' Bulletin No. 330. As a result of the growing scarcity of game animals in this country the supply of venison is wholly inadequate to the demand, and the time seems opportune for developing the industry of deer farming, which may be made profitable alike to the State and the individuals engaged therein. The raising of venison for market is as legitimate a business as the growing of beef and mutton, and State laws, when prohibitory, as many of them are, should be so modified as to encourage the industry. Furthermore, deer and elk may be raised to advantage in forests and on rough, brushy ground unfitted for either agriculture or stock raising, thus utilizing for profit much land that is now waste. An added advantage is that the business is well adapted to landowners of small means.

Respectfully,

C. HART MERRIAM,  
*Chief, Biological Survey.*

Hon. JAMES WILSON,  
*Secretary of Agriculture.*

# DEER<sup>a</sup> FARMING IN THE UNITED STATES.

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## INTRODUCTION.

The present bulletin discusses briefly the economic possibilities of raising deer and elk in the United States. It is believed that when the restrictions now imposed by State laws are removed this business may be made an important and highly profitable industry, especially since it will be the means of utilizing much otherwise unproductive land. The raising of venison should be, and is naturally, as legitimate a business as the growing of beef or mutton, and State laws should be so modified as to permit the producer, who has stocked a preserve with deer at private expense, to dispose of his product at any time, under reasonable regulations, either for breeding purposes or for food.

The growing scarcity of game mammals and birds in the United States and the threatened extinction of some of them over large parts of their present ranges make the preservation of the remnant highly important. Very important also is the increase of this remnant so as to make game once more abundant. It is believed that by means of intelligent game propagation, both by the States and by private enterprise, many of our depleted ranges can be restocked with big game.

## IMPORTANCE OF THE DEER FAMILY.

The members of the deer family (Cervidæ) rank next to the cattle and sheep family (Bovidæ) in general utility, and are the most important of the big game animals of America.

Wherever obtainable in quantity the flesh of deer of different kinds has always been a staple article of diet, and under present market conditions it is hardly necessary to say that venison is perhaps the most important game, being a favorite with epicures and also having a wide use as a substitute for beef and mutton, which meats it resembles in texture, color, and general characteristics. Its flavor

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<sup>a</sup> The term "deer" is here used in its general sense, in which it includes the elk, the reindeer or caribou, the moose, and other species, besides those usually referred to as deer.

is distinctive, though it suggests mutton rather than beef. In chemical composition it is very similar to beef, though, judging from available data, it is not so fat as stall-fed cattle. The following figures show how it compares with beef and mutton: A lean venison roast before cooking has been found to contain on an average 75 per cent of water, 20 per cent of protein or nitrogenous material, and 2 per cent of fat; a lean beef rump, some 65 to 70 per cent of water, 20 to 23 per cent of protein, and 5 to 14 per cent of fat; and a lean leg of mutton, 67 per cent of water, 19 per cent of protein, and 13 per cent of fat.

Venison, beef, and other common meats are very thoroughly digested, whatever the method of cooking. Venison may be roasted, broiled, pan-broiled, or used for making stews, in much the same way as beef. Venison, particularly steak, to be at its best, should be eaten as soon as possible after it is cooked.

The general popularity of venison is so great and the demand for it so widespread that overproduction is improbable. The other products of the deer—skins and horns—are of considerable importance, and in countries where deer are abundant and especially where large herds are kept in semidomestication, the commerce in both is very extensive.

#### THE DOMESTICATION OF DEER.

A number of species of the deer family have been proved to be susceptible to domestication. The reindeer, however, is the only one that has been brought fully under the control of man. The fact that the European red deer and the fallow deer have been bred in parks for centuries without domestication does not prove that they are less susceptible to the process than the reindeer. The purposes for which they have been held captive and the environment given them have been markedly different. It must be remembered, also, that few attempts have been made to rear and domesticate deer under intelligent management. The work has been largely a matter of chance experiment. If they had been as long under careful management as cattle, they would now, probably, be equally plastic in the hands of the skillful breeder.

But raising deer for profit does not necessarily imply their complete domestication. They may be kept in large preserves with surroundings as nearly natural as possible and their domestication entirely ignored. Thus the breeder may reap nearly all the profit that could be expected from a domestic herd, while the animals escape most of the dangers incident to close captivity. But the breeder who aims at the ultimate domestication of the animals, and whose herd approaches nearest to true domesticity, will in the end be most successful.

## SPECIES TO BE SELECTED FOR BREEDING.

The number of species of deer suited for breeding in inclosures in the United States is great, though the chances for success are by no means the same for all. As a rule those native to America are to be preferred, since they are already acclimated. In selecting any species, similarity between its natural habitat and that to which it is to be transferred must be considered. Important, also, is its adaptability to varied conditions, as shown by former attempts to acclimatize it.

Unless they have shown a peculiar adaptability to such change, deer should not be taken from arid parts of the United States to humid parts. To a disregard of this principle are probably due many of the failures that have attended experiments in breeding the American antelope, the Columbia blacktail deer, the moose, and other animals in places differing widely from their natural ranges.

The history of attempts to acclimatize the several kinds of deer shows that some readily adapt themselves to a great variety of conditions, and efforts to introduce them into new countries have been almost uniformly successful. Such has been the experience with the axis deer, the Japanese and Peking sikas, the red and the fallow deer of Europe, and especially with the wapiti, or Rocky Mountain elk, and the Virginia deer. While experiments with the foreign species named offer every promise of success to the owners of American preserves, there are obvious reasons for recommending the two native animals just mentioned as best suited for the production of venison in the United States.

### THE WAPITI, OR ROCKY MOUNTAIN ELK.

The wapiti (*Cervus canadensis*), including two related species and a geographic race, and known generally in America as the elk, is, next to the moose, the largest of our deer. It was once abundant over the greater part of the United States, whence its range extended northward to about latitude 60° in the Peace River region of the interior of Canada. In the United States the limits of its range eastward were the Adirondacks, western New Jersey, and eastern Pennsylvania; southward it reached the southern Alleghenies, northern Texas, southern New Mexico, and Arizona; and westward the Pacific Ocean.

For the practical purposes of this bulletin all the forms of the wapiti are treated as a single species. At the present time the range of these animals has so far diminished that they occur only in a few scattered localities outside of the Yellowstone National Park and the mountainous country surrounding it, where large herds remain. Smaller herds still occur in Colorado, western Montana, Idaho, east-

ern Oregon, Manitoba, Alberta, British Columbia, and the coast mountains of Washington, Oregon, and northwestern California. A band of the small California valley elk still inhabits the southern part of the San Joaquin Valley.

The herds that summer in the Yellowstone National Park and in winter spread southward and eastward in Wyoming are said to num-

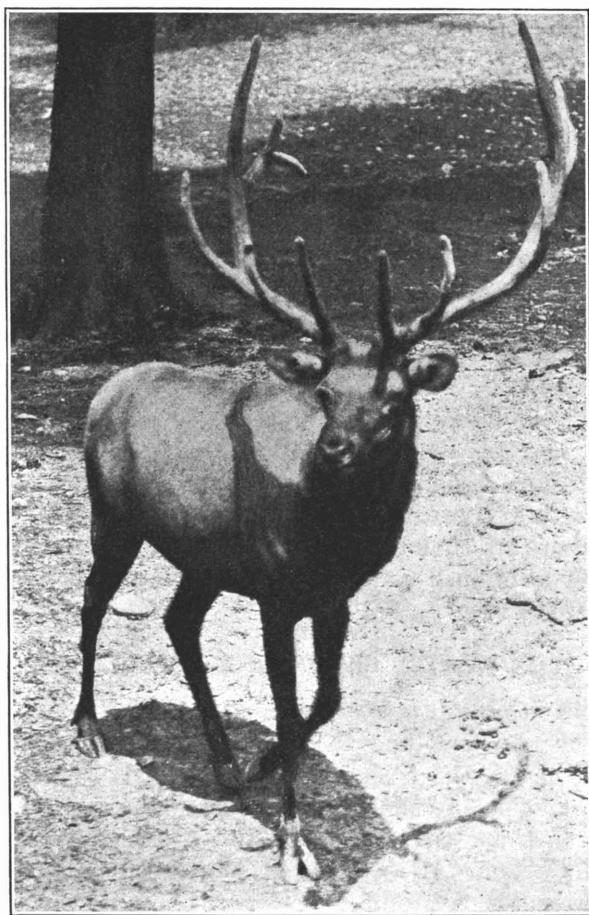


FIG 1.—Rocky Mountain elk.

ber about 30,000 head, and constitute the only large bands of this noble game animal that are left. Although protected in their summer ranges and partially safeguarded from destruction in winter by the State of Wyoming, there is yet great danger that these herds may perish from lack of food in a succession of severe winters. Partial provision for winter forage has been made within the National Park, but the supply is inadequate for the large numbers of animals.



Further safeguards are needed to place the Wyoming elk herds beyond the reach of winter starvation.

In addition to the wild herds, there are a considerable number of elk in private game preserves and parks, as well as in nearly all the public zoological parks and gardens of this country. The herds in captivity form the nucleus from which, under wise management, some of the former ranges of this animal may be restocked and from which a profitable business of growing elk venison for market may be developed. At the present time this species affords a most promising field for ventures in breeding for profit.

#### HABITS OF ELK.

The elk is both a browsing and a grazing animal. While it eats grasses freely and has been known to subsist entirely upon pasture, it seems to prefer a mixture of grass and browse.

The elk is extremely polygamous. The adult bulls shed their antlers annually in March or April, and new ones attain their full size in about ninety days. The "velvet" adheres until about August. While the horns are growing the bulls usually lead solitary lives; but early in September, when the horns are fully matured, the rutting season begins. Fights for supremacy then take place, and the victor takes charge of as many cows as he can round up and control. The period of gestation is about  $8\frac{1}{2}$  months. The female does not usually breed until the third year, and produces but one calf at a time.

Although the elk is less prolific than the common deer and some other species that have been bred in parks, it increases fully as rapidly as the common red deer of Europe. Moreover, it makes up for any lack of fecundity by its superior hardiness and ease of management. It has been acclimatized in many parts of the world, and shows the same vigor and hardiness wherever it has been transplanted. In Europe it has been successfully crossed with the Altai wapiti and the red deer, and in both instances the offspring were superior in size and general stamina to the native stock.

#### ELK VENISON.

The flesh of the elk, although somewhat coarse, is superior in flavor to most venison. That of the bulls is in its best condition about the time the velvet is shed. By the time the rut is over, in October, their flesh is in the poorest condition. As the open season for elk is usually in October and November, and only bulls are killed, it follows that hunters often obtain the venison when it is poorest. The meat is not best when freshly killed, but should be left hanging for four or five days before it is used. Of course fat elk are better eating than lean, and it is said that venison from castrated bulls is superior to any other.

## DOMESTICATION OF ELK.

With few exceptions the early attempts to domesticate elk were made by men who were wealthy enough to disregard all thought of profit in raising them. They were usually placed under the care of servants, and the bucks were left uncastrated until they became old and unmanageable. Soon the serious problem of controlling them outweighed the novelty of their possession, and one by one the attempts at domestication were abandoned.

A desire to preserve this important game animal has caused a renewal of attempts to breed it in confinement, and at present there are small herds under private ownership in many places in the United States. The Biological Survey has recently obtained much information from owners of herds in regard to their experience in breeding and rearing the animals, and also their opinions as to the possibility of making the business of raising them profitable. Of about a dozen successful breeders,<sup>a</sup> nearly all are of the opinion that raising elk for market can be made remunerative if present laws as to the sale of the meat are modified.

One especially important fact has been developed by the reports from breeders. It is that the elk readily adapts itself to almost any environment. Even within the narrow confines of the paddocks of the ordinary zoological park the animal does well and increases so that periodically the herds have to be reduced by sales.

The fullest reports that have been received by the Department of Agriculture from breeders of elk are from George W. Russ, of Eureka Springs, Ark., through H. N. Vinall, of the Bureau of Plant Industry.

Mr. Russ has a herd of 34 elk. They have ample range in the Ozarks on rough land covered with hardwood forest and abundant underbrush. The animals improve the forest by clearing out part of the thicket. They feed on buds and leaves to a height of 8 feet, and any growth under this is liable to be eliminated if the range is restricted. If not closely confined, elk do not eat the bark from trees, nor do they eat evergreens. In clearing out underbrush from thickets they are more useful than goats, since they browse higher. Goats, however, eat closer to the ground; and as the two animals get along well together, Mr. Russ recommends the use of both for clearing up brushy land and fitting it for tame grasses.

The increase of elk under domestication is equal to that of cattle. Fully 90 per cent of the females produce healthy young. An adult male elk weighs from 700 to 1,000 pounds; a female, from 600 to 800 pounds. The percentage of dressed meat is greater than with

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<sup>a</sup> The experiences of these breeders are, in the main, reserved for a more extended bulletin on the domestication of game mammals.

cattle, but, owing to hostile game laws, experience in marketing it is very limited. An offer of 40 cents a pound for dressed meat was received from St. Louis, but the law would not permit its export. Mr. Russ says:

From the fact that as high as \$1.50 per pound has been paid for this meat in New York City and Canada, and that the best hotels and restaurants pronounce it the finest of all the meats of mammals, we are of the opinion that if laws were such that domesticated elk meat could be furnished it would be many years before the supply would make the price reasonable compared with other meats. Elk meat can be produced in many sections of this country at less cost per pound than beef, mutton, or pork.

Mr. Russ thinks that large areas of rough lands in the United States not now utilized, especially in localities like the Ozarks and the Alleghenies, could be economically used to produce venison for sale, and he regards the elk as especially suited for this purpose.

Another feature of Mr. Russ's report is of more than passing interest. He says:

We find from long experience that cattle, sheep, and goats can be grazed in the same lots with elk, providing, however, that the lots or inclosures are not small; the larger the area the better. We know of no more appropriate place to call attention to the great benefit of a few elk in the same pasture with sheep and goats. An elk is the natural enemy of dogs and wolves. We suffered great losses to our flocks until we learned this fact; since then we have had no loss from that cause. A few elk in a thousand-acre pasture will absolutely protect the flocks therein. Our own dogs are so well aware of the danger in our elk park that they can not be induced to enter it.

Judge Caton, in his *Antelope and Deer of America*, also remarks on the animosity of elk toward dogs, and says that the does always lead in the chase of dogs that get into the elk park. If elk will attack and vanquish dogs and coyotes and thus help to protect domestic animals grazing in the same pastures, a knowledge of the fact may be of great advantage to stockmen who desire to give up herding sheep and to resort to fenced pastures instead. The addition of a few elk in the pasture may be an efficient protection from dogs, coyotes, and wolves. However, outside of fenced pastures elk do not always show themselves hostile to dogs and coyotes.<sup>a</sup>

#### MANAGEMENT OF ELK IN INCLOSURES.

Lorenzo Stratton, of Little Valley, Cattaraugus County, N. Y., began experiments in breeding elk about sixty years ago. His plan of management consisted essentially in taming the calves when very

<sup>a</sup> President Roosevelt reports in *Outdoor Pastimes of an American Hunter* that he saw a coyote walking unnoticed among a band of elk in Yellowstone Park; and Thomas Blagden, of Washington, D. C., informs the writer that noisy dogs were used to drive unconfined elk from the lawns of summer cottages at Saranac Inn, in the Adirondacks.

young and continuing the petting process with the entire herd. He visited the animals daily in the pasture and always carried dainties to feed them. As the bulls became old and developed signs of viciousness, they were castrated, younger animals being used for breeding. He thus developed a thoroughly domesticated herd.

For economic reasons, it is not always possible to follow Mr. Stratton's plan. Those who grow the animals for venison and in large preserves would find it impracticable to tame all the calves. However, if elk or deer are grown for stocking parks or private preserves, the tamer they are the easier it will be to handle and ship them.

**Range.**—In choosing a range for elk, the natural food supply is important. They thrive best in preserves having a variety of food plants—grasses, bushes, and trees. Rough lands, well watered with clear streams and having some forested area, are well adapted to their needs. About as many elk can be kept on such a range as cattle on an equal area of fair pasture. There should be thickets enough to furnish winter browse, but this should be supplemented by a supply of winter forage.

**Food.**—Except when deep snows cover the ground, elk will keep in good condition on ordinary pasture and browse; but a system of management that provides other food regularly will be found more satisfactory. Hay and corn fodder are excellent winter forage; but alfalfa hay has proved to be the best dry food for both elk and deer. A little oats or corn—whole or chopped—may be fed each day. Elk are fond of corn, and feeding it affords excellent opportunities for winning their confidence and taming them. The same may be said of salt, which should be furnished liberally to all deer kept in inclosures. Running water, although not essential, is of great importance in maintaining elk in good condition.

**Fence.**—Elk are much less nervous than ordinary deer, and less disposed to jump fences. When they escape from an inclosure they usually return of their own accord. If tame, they may be driven like cattle. Ordinarily, a 5-foot fence of any kind will confine elk. Henry Binning, of Cora, Wyo., writes us that a 4-foot woven-wire fence is ample for these animals. A small inclosure in which a vicious bull elk is to be kept should be higher and of stronger material. Mr. Russ's report, already partly quoted, states that where lumber for posts is cheap a good elk fence may be built for \$200 a mile. But the actual cost will, of course, vary greatly according to style, price of labor, nearness to market, and other circumstances.

**Cost of stock.**—The cost of stocking an elk preserve is not great. Usually surplus stock from zoological parks or small private preserves may be obtained at low cost, varying with the immediate demand for the animals. At times they have sold for less than \$20 a

head, and with the present restrictions on sale, low prices are likely to continue. A few years ago T. J. Wilson, of Lewisburg, Ohio, paid \$165 for three animals. A Michigan breeder recently offered to deliver a dozen head, sex and age not given, all fine specimens, for \$500. This is, of course, a low price, not more than cattle would bring and less than the venison would be worth if it could be sold. If restrictions on the sale and shipment of venison from private preserves were removed, prices of the stock would, of course, soon advance, and necessitate a greater outlay in starting the business.

**Vicious male elk.**—The male elk is ordinarily docile, but in the rutting season the older ones often become ill-tempered and dangerous. Several tragedies connected with attempts to domesticate elk are matters of history. One was recorded by Judge Caton in his *Antelope and Deer of America* as having occurred in his own park. Another took place at Bull City, Osborne County, Kans., in October, 1879, and resulted in the instant death of Gen. H. C. Bull, the mortal wounding of two other men, and the serious injury of another, from the attacks of an infuriated bull elk that had previously been regarded as extremely gentle.

Wild and unconfined deer and elk flee from man under nearly all circumstances, but when wounded and closely pressed they have been known to attack hunters. It is unlikely that, even in the rutting season, a wild bull elk would attack a human being. But the tame or partially tame animals that have become familiar with man are to be feared and should not be approached in that season without extreme caution. A male elk or deer that has once shown viciousness can not again be trusted.

The remedy for viciousness in the male elk is castration. It is unsafe to keep an uncastrated male elk over 4 years old, unless he is in a strongly fenced inclosure from which visitors are excluded. The effects of castration are to make the animal docile and to greatly enhance his value for venison. This is in accord with observed results in the production of beef, pork, and mutton. Venison grown in domestication under a system in which the male animals intended for slaughter are castrated should be uniformly of the highest grade and far superior to that obtained in the wild state during the usual open season for hunting. This consideration is of the greatest importance in fixing the final status of venison grown under domestication.

#### **BREEDING THE VIRGINIA DEER.**

The Virginia, or whitetail, deer (*Odocoileus virginianus*) is the common deer of the United States. Including the half dozen geographic races that occur within our borders, it is distributed over most of the country, except Nevada and the major portions of Utah,

Arizona, Washington, Oregon, and California. It is extinct in Delaware and practically so in a number of States in the Middle West. South of our borders a number of closely related species occur.

In view of the wide natural range of the whitetail deer, its adaptability to nearly all sections of the United States can not be doubted. Testimony as to its hardiness in parks and preserves is not so unanimous as that concerning the wapiti; but the general experience of breeders is that with suitable range, plenty of good water, and reason-



FIG. 2.—Herd of domesticated Virginia deer belonging to R. H. Harris, Clarkesville, Tex.

able care in winter, raising this deer for stocking preserves or for venison may be made as profitable as any other live-stock industry. Not only do deer thrive on land unsuited for cattle or horses, but, like elk, they may be raised to great advantage in brushy or timbered pastures fully stocked with cattle or horses, as the food of deer rarely includes grass.

Advocates of the Angora goat industry state that within the United States there are 250,000,000 acres of land not suited to tillage or to the pasture of horses, cattle, or sheep, which are well adapted to goats. Much of this land is suited also to deer and elk, and can be utilized

for these animals with less injury to the forest cover than would result from its browsing by goats.

The whitetail deer has often been the subject of experiments in domestication. The beauty of these animals, especially the fawns, appeals to every admirer of wild life, and early settlers of the country soon learned how easily they could be tamed and how promptly they attached themselves to the persons who fed them. The dangerous character of the same pets, especially the males, when grown up was soon learned also. It followed that the domesticating process usually ended with the maturity of the first subject, which was soon disposed of or banished to a safe inclosure.

The propagation of the Virginia deer has seldom been undertaken in a systematic way. The animals have often been bred in parks for pleasure or in large preserves for sport, but the economic possibilities in raising them have received little attention. Recently breeders have recognized the fact that they are profitable under proper management and would be much more so were conditions for marketing live animals and venison more favorable.

#### EXPERIENCES OF BREEDERS.

The Biological Survey has reports of successful experience in raising Virginia deer from more than a dozen persons, located in different parts of the country, who are now engaged in the business. The management of the herds varies slightly with the surroundings and the object for which they are kept.

Thomas Blagden, of Washington, D. C., began raising deer in 1874. After an experience of over a third of a century he is confident that the business can be made profitable. In his own herds he has carefully avoided in-breeding by securing new bucks from time to time. His stock is vigorous and of the large size characteristic of the Adirondack and other northern deer. Consequently the animals are in demand for breeding purposes, the bucks bringing \$50 each and the does \$75. He feeds grain, using corn and a mixture of bran and meal, and during the summer cuts as much wild forage as possible. He finds that the animals prefer the rankest weeds to the choicest grass. Of the various kinds of hay, they prefer alfalfa. He provides abundant water at all times.

John W. Griggs, of Goodell, Iowa, writes that he has been engaged in raising deer for about fourteen years. Until two years ago he sold all his surplus stock for parks, but since then has disposed of about half of it for venison. For park purposes he gets \$20 to \$30 a head, but they bring fully as much or more when fattened for venison. As to management of deer, Mr. Griggs writes:

In raising a large herd the park should be divided into two or three lots, and one plowed each year and sown to red clover, mustard, rape, and seeds of different kinds of weeds. Bluegrass and timothy are useless. Corn is the

principal grain I feed. I feed it winter and summer. In winter I feed also clover hay, oat straw, and weedy wild hay. Deer when rightly handled are very prolific, and from 50 does one can count on 75 fawns. They can be raised profitably for venison—very profitably until overdone; but I would not advise one to go into it on a large scale without previous experience with deer.

The report received from C. H. Roseberry, of Stella, Mo., although less enthusiastic than others, is quoted because his herd approaches more nearly a state of true domestication. Under the date of January 13, 1908, Mr. Roseberry wrote as follows:

My experience in breeding the common or Virginia deer covers a period of seventeen years, beginning in March, 1891, when, as a boy of 16, I built a small inclosure of  $1\frac{1}{2}$  acres to confine a single doe that was captured as a fawn in the neighboring forest.

A buck and other does were secured from year to year, until in 1900, by purchase and natural increase, my herd numbered 25 head of all ages.

From 1891 to 1901 I lost every year from disease an average of 20 per cent. The climax came in the drought year of 1901, when my loss was 50 per cent from the disease known as "black tongue."

I am convinced that, like cholera in swine, individuals recovering from this disease are immune from further attack. Apparently all of my herd were afflicted. The survivors and their progeny constitute my present breeding stock. I have made no purchases since 1901, nor have I suffered any loss from disease.

For the last seven years my herd has averaged 70 per cent increase, all of which I have sold at satisfactory prices. I began selling at \$20 per pair of fawns at 4 months of age and \$30 per pair of adults. I now get \$40 and \$60, respectively. I sell almost exclusively for pets and for propagating purposes, although a few surplus bucks have been sold for venison, averaging me 15 cents per pound gross weight.

If we except the goat, I know of no domestic animal common to the farm that requires so little feed and attention as the deer. My herd has a range of only 15 acres, two-thirds of which are set to white clover, bluegrass, and orchard grass. I provide also a small plat of wheat or rye for winter pasture. With the above provision, in this latitude, no feed is required between April 15 and November 15. During the rest of the year a ration of corn, bran, or other mill feed somewhat smaller than that required for sheep, in connection with a stack of clover or pea hay to which they have free access, is sufficient to keep them in good condition. Deer eat with relish nearly all of the common coarse weeds, and for clearing land of brush they are, I think, second only to the common goat.

Probably the greatest expense connected with the business of raising deer is the fencing. Another item of trouble and expense, when the animals are raised for pets, requiring that they be handled and shipped alive, is the fact that the fawns must be taken from the does when 10 days old and raised by hand on cow's milk. They are quite easily raised in this way, with but slight percentage of loss, but require frequent and careful attention for the first month. When they are allowed to run with the does their natural wildness can not be overcome, no matter how gentle the does may be.

I have found the business profitable on the lines indicated. I believe they could be profitably bred for venison alone—certainly with less trouble and expense, since the fawns would be reared by the does and the trouble and expense of raising by hand would be eliminated.



My experience does not coincide with that of some other breeders<sup>a</sup> in respect to the weakening of reproductive powers of deer by the confinement in parks. I have no barren does. Usually they produce a single fawn at two years of age; afterwards twins, and in rare cases triplets.

#### MANAGEMENT OF VIRGINIA DEER.

As to the management of deer little need be added to the statements from practical breeders already given. Virginia deer are polygamous, like cattle; the rutting season is in November; the period of gestation is about seven months, and the fawns are born in May or June. Young does usually breed when about 17 months old and have but one fawn the first time; afterwards they commonly produce twins. The fawns are spotted until the first shedding of the hair in the fall.

While deer are chiefly browsing animals, in captivity they eat nearly every kind of vegetation, including most kinds of garden stuff. They are fond of acorns, beechnuts, chestnuts, and other mast. Lily pads, leaves, lichens, and mosses are freely eaten. With plenty of range and an abundant variety of plants there need be, therefore, no apprehension concerning the deer's food. A good supply of running water must be provided, and the animals should have access to rock salt. If the browse and pasturage are scant, a small ration of grain should be fed. Of the grains, corn is generally recommended as a food; there is no waste, as the deer pick up every grain. Coarse hay full of weeds is preferable to timothy or other tame hays, except alfalfa. Of clover hay, deer usually eat the blossom heads greedily, but waste the other parts. In winter feeding is necessary everywhere, and in the northern half of the United States shelter of some kind should be provided.

The remarks about castrating elk apply as well to the common deer. A number of vigorous bucks, however, must be kept with any considerable herd of does, for a single buck can not serve an unlimited number. Frequent changes of blood by introducing new bucks should be practiced to avoid inbreeding.

#### WILD DEER IN PRIVATE GAME PRESERVES.

Individual owners, as well as associations, have established large private preserves in many parts of the country and stocked them with deer and other big game. The objects have been to preserve the animals and to provide sport for the owners. In the free life under the protected conditions generally provided, deer do remarkably well, the increase being even more rapid than in small parks. There can

<sup>a</sup> See Antelope and Deer of North America, by J. D. Caton, p. 304. 1877.

be no doubt of the success of ventures in propagating the Virginia deer under natural conditions as wild game, as is proved by the experience of a large number of hunting clubs and private owners.

Deer in Buckwood Park, a New Jersey preserve of 4,000 acres, belonging to Charles S. Worthington, increased in the ten years between 1892 and 1903 from 19 to about 400 head, and the number was then lessened because it was thought too large for the permanent sustaining capacity of the park. The St. Louis Park and Agricultural Company have about 1,000 deer and 400 elk in their 5,000-acre preserve in Taney County, Mo. The Otzinachson Rod and Gun Club six years ago placed about 90 deer, mostly does, in their 4,000 acre park in Clinton County, Pa. These have multiplied to nearly 2,000 head, and a further increase of about a thousand fawns is expected during the present season (1908). Doubtless these experiences are not exceptional.

The good effect of such preserves on the supply of game in the State should not be overlooked. While they may temporarily restrict the hunting privileges of a few citizens, they ultimately become a source of game supply secondary in importance only to State preserves or game refuges. Already a number of private reserves have become overstocked, and game has escaped or been turned over to the State to become the property of the people. The success of private enterprise in propagating large game in inclosures has thus become an object lesson for State game commissioners and others, and suggests the feasibility of the State's undertaking a similar work for the people.

#### **GAME LAWS IN RELATION TO DEER FARMING.**

The chief obstacle to profitable propagation of deer in the United States is the restrictive character of State laws governing the killing, sale, and transportation of game. Many of the States, following precedent, lay down the broad rule that all the game animals in the State, whether resident or migratory, are the property of the State. A few States except game animals that are "under private ownership legally acquired." A few others encourage private ownership by providing a way in which wild animals—deer and the like—may be captured for domestication. Generally, when private ownership of game is recognized by law, the right to kill such game is granted, but the owner is hampered by the same regulations as to season, sale, and shipment that apply to wild game. One by one, however, State legislatures are coming to recognize the interests of game propagators, and game laws are gradually being modified in accordance with the change of view.

The chief source from which deer and elk may be obtained for stocking preserves is from animals already in captivity. These must

be transported from place to place or there can be no commerce in them, yet the laws of many States absolutely forbid their shipment. The laws as to possession and transportation of deer carcasses make the shipping of venison also illegal. General export of venison is legal from only six of the States, and three of these have no wild deer left to protect.

The laws concerning the season for killing and the sale of deer are often equally embarrassing to those who would produce venison for profit. The owner of domesticated deer can not legally kill his animals except in open season. Owners of private preserves are similarly restricted and are limited to the killing of one or two animals in a season. More than half the States and Territories absolutely forbid the sale of venison. A few forbid the sale of venison produced within the State, but permit the sale of that imported from other States, a most unjust discrimination against home industry.

The following States have recently modified their laws so as to provide, under regulations, for the sale of deer from private preserves. Transportation and even export are included in some of them.

**Arkansas.**—Possession, sale, and shipment of deer or fawns is permitted when they have been raised in captivity for domestic purposes and are accompanied by an affidavit from the raiser.

**Colorado.**—Owners of private preserves under a license are permitted to sell and ship deer or other quadrupeds that are accompanied by an invoice. A fee is required for each animal sold.

**Illinois.**—Any person who raises deer for market may kill and sell them at any time in the same manner as other domestic animals.

**Indiana.**—The provisions of the law as to possession and sale do not apply to persons who have under ownership or control any deer raised in a deer park.

**Massachusetts.**—The owner may sell his own tame deer kept on his own grounds.

**Minnesota.**—Persons who desire to domesticate deer, moose, elk, or caribou may secure a permit to do so from the State board of game and fish commissioners by paying a fee of 50 cents for each animal in captivity and a like fee for each animal added later by natural increase or otherwise. The animals kept in captivity may be sold or shipped within or without the State, by permission of the commissioners.

**Missouri.**—Deer or elk, alive or dead, may be shipped from any private preserve and sold in the markets of the State when accompanied by a tag furnished by the game warden of the county, showing whose property it is, where killed, and to whom shipped.

**New Hampshire.**—The Blue Mountain Forest Association may kill elk, deer, or moose in their preserve for one month after the open season, and at any time may transport them outside the State.

**New York.**—Deer may be sold during the open season; and moose, elk, caribou, and antelope from private parks may be sold during the same period. Common carriers may transport animals into the State for breeding purposes, but may not transport venison unless it is accompanied by the owner.

**North Carolina.**—Seventeen counties permit the owner and keeper of an inclosed game reserve, who raises deer for use or sale, to kill, sell, or use those raised or kept in said inclosure.

**Pennsylvania.**—Owners of game preserves who hold a game-propagating certificate may sell and transport deer or fawn alive for propagating purposes only, after securing the written consent of the president of the board of game commissioners.

In three or four other States game “under private ownership, legally acquired,” is supposed to be exempt from the general provisions of the game law; but in a test case as to its sale or export it is doubtful whether the courts would so hold without more specific provision legalizing such commerce.

#### SUMMARY.

The domestication of deer and elk offers an interesting field for experiment, as well as remunerative returns for the investment of capital.

The wapiti and the Virginia deer can be raised successfully and cheaply under many different conditions of food and climate. The production of venison and the rearing of both species for stocking parks may be made profitable industries in the United States.

Instead of hampering breeders by restrictions, as at present, State laws should be so modified as to encourage the raising of deer, elk, and other animals as a source of profit to the individual and to the State.

Safeguards against the destruction and sale of wild deer in place of domesticated deer are not difficult to enforce. For this purpose a system of licensing private parks, and of tagging deer or carcasses sold or shipped, so that they may be easily identified, is recommended.

It is believed that with favorable legislation much otherwise waste land in the United States may be utilized for the production of venison so as to yield profitable returns, and also that this excellent and nutritious meat, instead of being denied to 99 per cent of the population of the country, may become as common and as cheap in our markets as mutton.