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# OREGON AGRICULTURAL COLLEGE EXTENSION SERVICE

## HORSE MANAGEMENT

BY

ERMINE L. POTTER  
CARL N. KENNEDY  
Animal Husbandry Department,  
Corvallis, Oregon.

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The bulletins of the Oregon Agricultural College are sent free to all  
residents of Oregon who request them.

## NUMBERS AND GENERAL CONDITIONS.

There are in the United States at the present time approximately 24,000,000 head of horses, about 3,000,000 of which are in the cities, the remainder being on the farms. The United States produces about one-fourth of all the horses produced in the world. As near as can be estimated there are in all countries at the present time approximately 96,000,000 horses. There are in United States at the present time about 4,000,000 mules, slightly over half of the total number in the world.

The number of horses and mules has doubled in the United States in the last fourteen years. Most of this increase has been during the first ten years of the last period. During the last four years the number of horses and mules has been practically at a standstill. There have been many reasons given for this apparent lack of interest in horses, but it is difficult to state what is the real reason for the trouble. More than likely the automobile and auto truck have had some influence upon decreased production of horses, especially among the cheaper grades, while on the other hand financial conditions have perhaps had something to do with it. During the ten years previous to the time when the number of horses started to increase there was a decided decrease, due largely to the financial depression of 1893, and the years immediately following. For forty years previous to 1890, or about as far back as we have a record, the number was slowly increasing. The increase during the past ten years is of course much faster than the increase in population, and that may be one of the reasons why at the present time there is apparently a standstill in horse production. Reliable authorities, however, state that they believe that the time was never better than the present for the production of high-class draft horses and for good horses of the lighter breeds. There is an especially strong demand coming for the very best of American saddle horses, and also for the best of the heavy-harness or coach horses.

The average farm value of horses in the United States, according to estimates by the United States Department of Agriculture, is about \$110 a head. The estimated value of mules is \$124 a head. The value has increased very rapidly since 1897, when the average was \$31.50. During the year 1897 the value in the Western states was even lower. In this State hundreds of horses were slaughtered for meat purposes at prices from \$1.50 to \$2.50 a head.

### Horse Producing Sections.

The leading horse-producing states are, in order, Iowa, Illinois, Texas, Kansas, Missouri, and Nebraska. These are the states that have over 1,000,000 head. Texas has a cheaper grade of horses than the other states in this list, and if value instead of numbers was the basis of this classification, Texas would be surpassed by all the other states mentioned and also by Ohio and Indiana. It will be seen, therefore, that considering area the real horse-producing states are those where there is the greatest amount of tillable land devoted to general farming; in other

words, the corn belt. There are a number of immense horse ranches on the ranges of the Western states, but even then the number of horses is small. Oregon has 300,000, while the average for each state in the entire Union is 500,000. Oregon, Washington, and California are the leading horse-producing states of the West, but none of these states, in spite of their immense size, has its average proportion of horses. This is not due to any lack of horse raising, but to the much smaller area of tillable land. In the Southern states the number of horses is relatively small because of the general backward state of agriculture, and also because of the larger number of mules. There is a decided tendency, however, in the South for the use of more horse power, and especially for the raising of larger horses and mules.

The tendencies which work toward a large number of horses of a better quality are, first of all, an abundance of well-tilled land devoted to grain and hay. Generally speaking, the higher priced the land the more numerous the horses, excepting, however, in fruit and other special areas. Where the land is of low productive value, we find poor horses, and only a few of them, as for instance in the South. In the West we find in those fertile valleys where the best crops are grown many of our best horses. On the ranges and in rougher countries, generally speaking, we find the poorest horses. Of course, the kind of people has a great deal to do with the kind of horses, but the best farmers, like the best horses, are usually found on a richer soil.

In mule production Texas is the leading state in point of numbers, while Missouri leads in the value of the mules produced. All of the Southeastern and South Central states are heavy producers of mules. Some of the extreme Southern states, however, buy a great many of their mules from some of the states just north of them. Eleven of the states in the South have within their boundaries two-thirds of all the mules in the United States. In other words, they have over 3,000,000 head. Eleven of our Western states have less than one-twentieth as many. Texas has 753,000, and Oregon 10,000.

Within our own State Table 1, from a report of the 1910 census, gives a good idea of the importance of the various counties from the standpoint of raising horses, mules, and asses. It is to be noted in the report, however, that the number given denotes horses on the farms, and does not include horses in the cities. For instance, Multnomah County, with Portland within its boundaries, is scheduled as one of the smallest counties in regard to the number of horses, while in reality it has more than any other county in the State. They are horses that are employed in city work, however, and are not used for breeding purposes.

It will be noted that Linn and Marion Counties are the leading horse-producing counties in Western Oregon, but that Umatilla, Crook, Malheur, Harney, Baker, and Grant Counties all have more than these counties, and that Lake, Union, Wallowa, and Wasco have nearly as many. The following counties, all in Western Oregon, have less than 2,000 head: Clatsop, Curry, Columbia, Josephine, Lincoln, Tillamook. In Eastern Oregon only one county has less than 6,000, and that is Hood River with only 1,364. Hood River's development as a fruit

TABLE 1.

	Horses		Mules		Asses & Burros	
	Number	Value	Number	Value	Number	Value
The State.....	271,708	\$25,181,143	9,927	\$1,183,788	548	150,777
Baker .....	12,762	1,032,964	170	15,355	23	6,475
Benton .....	4,317	581,971	64	10,095	8	1,730
Clackamas .....	8,943	1,070,889	75	10,690	2	40
Clatsop .....	855	90,741	3	130	.....	.....
Columbia .....	1,650	177,395	10	1,475	.....	.....
Coos .....	2,873	295,287	21	2,485	5	125
Crook .....	19,929	1,190,360	187	16,720	26	6,210
Curry .....	902	76,909	45	3,520	12	1,785
Douglas .....	6,883	740,605	139	17,640	5	100
Gilliam .....	8,179	803,844	974	137,215	17	6,245
Grant .....	11,973	632,513	178	14,910	11	5,530
Harney .....	12,886	896,737	638	62,325	40	17,540
Hood River .....	1,364	203,661	9	1,725	.....	.....
Jackson .....	5,856	647,687	303	46,415	42	2,007
Josephine .....	1,900	199,426	72	7,490	8	1,445
Klamath .....	11,910	907,453	885	72,663	46	21,475
Lake .....	9,633	523,050	467	40,953	61	7,020
Lane .....	8,947	1,009,556	135	17,260	10	310
Lincoln .....	1,213	115,682	19	2,415	4	95
Linn .....	11,488	1,353,785	150	19,775	4	90
Malheur .....	15,108	1,028,818	666	61,169	35	11,540
Marion .....	11,288	1,383,380	157	14,398	6	1,410
Morrow .....	8,109	642,071	610	67,210	37	11,850
Multnomah .....	3,415	431,184	32	4,350	1	1,000
Polk .....	6,344	789,763	37	4,865	1	25
Sherman .....	8,472	912,230	355	52,530	2	600
Tillamook .....	1,572	186,847	15	1,870	2	300
Umatilla .....	19,054	1,837,791	2,195	325,865	18	8,815
Union .....	11,348	1,219,634	180	20,595	20	7,085
Wallowa .....	10,874	1,035,213	369	34,125	53	8,305
Wasco .....	10,002	863,325	400	53,870	19	15,990
Washington .....	7,777	948,892	132	18,810	6	595
Wheeler .....	6,496	431,836	155	11,105	22	3,700
Yamhill .....	7,386	919,734	80	13,770	2	620

Number and value of Horses, Mules and Asses.

district has practically driven out the live stock. In addition to the horses mentioned, Hood River County has 1,300 cattle, 9 mules, 452 hogs, 225 sheep, and 15 goats. In those counties of Western Oregon which have but few horses, the reason is due largely to the backward condition of agriculture and to the large amount of forest land. Such counties as Lincoln have no people to raise horses and little tillable land upon which to raise pasture and feed. The same may be said of most of the other coast counties. In Eastern Oregon, the large number of horses is due to various reasons in the different sections. The general farming regions like Union, Baker, and Wallowa valleys are always favorable to horse raising. The big wheat counties bordering on the Columbia river have immense numbers of horses to pull their big machinery. These counties work the largest teams and have the biggest machinery to be found in the State, as big indeed as any found in the world. Most of the other counties are largely range, and consequently have large numbers of horses in spite of the fact that most of this range is devoted to sheep and cattle. The large numbers of horses found in Grant and Harney counties are nearly all on the ranges. We hear very little these days about the range-horse business and it is not what it once was, but there are still thousands of range horses in Central Oregon. In fact, we find range conditions in Central Oregon more nearly like the original range conditions of the story books than anywhere else in the United States. The stock of horses has been improved, and gun play is no longer allowed, but the outlaw broncho is still there in spite of the automobile and the real estate promoter.

Compared with other lines of live stock, the number of horses in the United States is about one-half that of sheep or of hogs, and only one-third that of cattle. In money value, however, the horse is ahead. There is more money invested in horses and mules in the United States than in all other kinds of live stock put together, and even the mules are worth more money than the sheep and hogs. In this State we have not quite the same proportion of horses, but even then the value of our horses is several times that of our dairy cattle, in spite of the fact that Oregon is considered a dairy state. There are fewer people who make their entire living out of horses than out of any other kind of live stock, but on the other hand, more people, who own a few horses, are interested in the raising and care of them.

### **Exports and Imports of Horses and Mules.**

The United States has during the last three or four years imported about 10,000 horses annually and their estimated value has been about \$285.00 a head. Of this number perhaps 3,000 have been pure bred, imported for breeding purposes. Their average value at the port of entry is given from \$400 to \$500 a head, in spite of the fact that very large numbers of these horses sell to the farmers at \$3,000 each. There is a tariff on all horses imported to this country except those brought in for breeding purposes. The customs officials, however, do not recognize as being imported for breeding purposes any horses other than those which are pure bred and registered in a stud book, recognized by the Department of Agriculture at Washington, D. C. The pure breeds imported are mostly Percherons, Belgians, Shires, and German Coach. A few Clydesdales, French Coach, and other breeds, however, are brought in. Those not pure bred are mainly work stock brought in from Canada. The numbers are so small as to be unimportant. The pure breeds, however, do have a very marked influence on the pure-bred horse trade of this country and are also having a marked influence in improving our native draft stock.

During the past few years, or since the Boer War, our exports of horses have been from 30,000 to 40,000 head. These are mostly work stock and go to various countries. The number of mules exported annually is about 4,000. As with horses, the export trade of mules is not of great importance; but in both cases it shows that we export rather than import, and this of course has a marked influence upon the market price of horses, even though the number exported be very few.

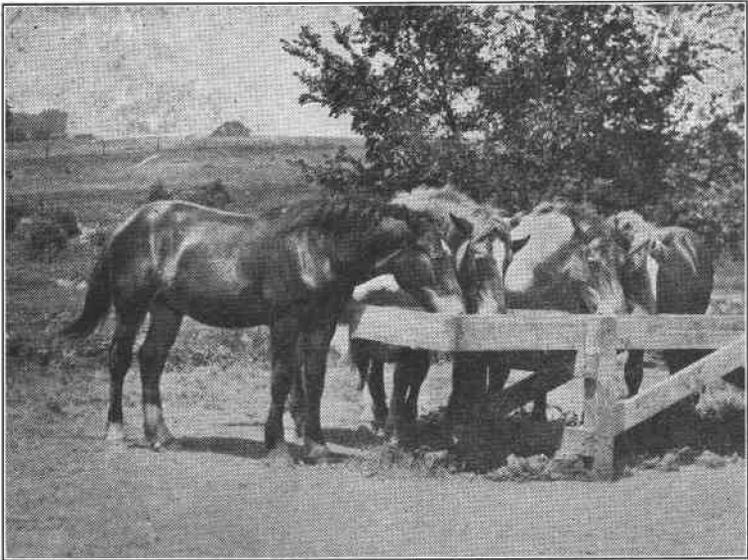
Under usual conditions, however, we may export large numbers. During the Boer War nearly the entire English cavalry was mounted on American horses. There was a buyer for these horses in nearly every western town during those years and the supply of cayuses was pretty well cleaned up. Selling all of this light, cheap grade of horses to the English during these years had a marked influence in improving the horses of our western states. During the present European war there is a strong demand for all kinds of cavalry and artillery horses. It has also practically stopped the importing of European horses to this country for breeding purposes.

## HORSE FEEDING.

The feeding of horses must be taken up from three distinct stand-points: One, the growing of horses; two, the maintaining of mature horses without work; three, the feeding of mature horses at work.

### Growing Horses.

The fundamental principles involved in growing horses are practically the same as the growing of other kinds of live stock. The chief need of the body at this time is for protein and for mineral matter or ash. It is therefore especially important that these nutrients be supplied in the proper quantities. On an average, the proper nutritive ratio for growing horses will be about one to five or one to six; that is, the ration will need to contain from five to six parts of carbohydrates, or their equivalent, to one part of protein. Of the common feeds best adapted to produce such ratio may be mentioned the leguminous hays, such as alfalfa, clover, and vetch, and among the grains, oats and bran will be the best. The native pasture grasses when thrifty will usually supply about the proper nutrients for the growing horse. Among the feeds which are deficient in protein and mineral matter, and therefore unsatisfactory for



No. 1. Yearling draft stallions getting feed to supplement the pasture.

growing horses, may be mentioned timothy hay, cheat hay, corn, and barley. When any of these feeds are used for young horses, a liberal amount of other feeds, containing large quantities of protein and mineral matter, should be supplied. A great many people in raising their young horses make a mistake by not supplying them with a liberal enough ration, especially during the first year. After the colt is weaned from

the dam it is a very hard matter to keep it up in good shape, and at such time special care and feed should be given it. The feed is seldom made too liberal at this time, since this is the time to "shove" the colt if exceptional growth is desired. Most horsemen agree that if you stunt the colt you stunt the horse, and that if you have a stunted yearling you seldom get a good-sized mature horse. On the other hand, a growthy yearling does not need the feed nor care afterwards that the stunted one demands. After the young colt passes the yearling stage, it does not need the special care nor the feed that the colt does during the first winter.

#### **Idle Horses.**

In the case of mature horses maintained in idleness the needs of the body are primarily for carbohydrates and fats; in other words, for heat-producing, or energy-producing feeds. Since the body already has attained full growth, protein and mineral matter will be needed only to make up for the loss due to the natural wear and tear on the body tissues. Most any of the common feed stuffs will therefore furnish a sufficient amount of these nutrients. Such bulky feeds as straw and the poorer quality of hay, which would not do for work horses, may be used to advantage in this case. It has been found that the energy required for the mastication and digestion of wheat straw is about equal to the total energy of the feed, and therefore the energy which can be derived from wheat straw and converted into actual work is very small, so small in fact that such a feed has little value for hard-working horses. In the case of an idle horse, however, where the chief need of the body is for heat-producing foods, we find that this energy from the wheat straw which was used up in its own digestion and assimilation, is converted finally into heat and thus serves to maintain the heat of the body. Thus it is that these foods with a very small amount of net energy may be used to advantage in maintaining idle horses. Another point in favor of using bulky feeds for this purpose is that the total amount of digestible nutrients required to maintain a horse in idleness is comparatively small, and if given in concentrated form, such as some of the rich grains, the horse would not get enough feed to satisfy the appetite, and would be very ravenous and less thrifty. Furthermore, this small quantity of rich foods would be apt to cause digestive disorders.

#### **Work Horses.**

In the feeding of a hard-worked horse the essential points are to give feeds containing a large amount of net energy and feeds of such nature as will agree with the digestive system of the horse under the conditions of severe work. The bulk of this energy must be obtained from some of the grains. From this standpoint of energy alone corn would be the best, with barley next, and wheat next. When we take into consideration the effect on the digestive system, however, we find that oats are distinctly the best food; although horses may be fed successfully on either corn or barley. Such hays as clover, vetch, and alfalfa, which are especially good for the growing horse, also contain a considerable amount of energy, and from that standpoint would be good for the

hard-worked horse; but because of their washy effect they are less desirable than some of the less nutritious hays, such as timothy. Timothy does not contain a large amount of digestible nutrients, but because of its favorable influence upon the digestive system of the hard-working horse it has long been a common practice to use it almost exclusively and to depend upon the grain for most of the digestible nutrients. As in the case of an idle horse, the demands of the body for protein and mineral matter are comparatively small, and there are very few feeds in common use which do not contain a sufficient amount of these nutrients. An excess of protein, however, will not be harmful, and will in fact be useful, since it may be used for the same purposes in the body as the carbohydrates and fats; that is, for the production of energy. There is a limit, however, to the amount of protein which may be successfully fed. Since all of the nitrogen taken into the body must be taken out of the kidneys, an excess of protein will produce disorders of these organs. The limit of the amount of protein which may be fed to a horse varies greatly with different individuals, and there is no way of telling beforehand just where the limit lies.

To summarize: The essential point with a growing horse is to furnish feeds that will supply the necessary amount of mineral matter and protein. These feeds must be appetizing and of a somewhat laxative nature.

Idle horses should be fed bulky food with a fair amount of energy value. Such foods not only give the best results, but are the most economical.

Hard-worked horses require little protein but much carbohydrates and fats. These feeds must be fairly concentrated and must not have a washy, laxative tendency.

#### **Good Rations.**

1500 pound horse at steady farm work,	7½ lbs. bran 7½ lbs. barley 15 lbs. timothy and clover, half and half.
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1500 pound horse at steady farm work	15 lbs oats 14 lbs. alfalfa, clover, or vetch.
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#### **Questionable Rations.**

1500 pound horse at steady farm work,	15 lbs. bran 15 lbs. alfalfa or vetch.
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1500 pound horse at steady farm work,	15 lbs. barley 15 lbs. timothy or wheat hay.
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#### **Bad, But Common Rations.**

1500 pound horse at steady farm work,	15 lbs. barley 15 lbs. cheat.
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1500 pound horse at steady farm work,	10 lbs. oats 22 lbs. vetch, clover or alfalfa.
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**Best Rations.**

1500 pound horse at steady farm work,	15 lbs. oats 15 lbs. timothy and clover, half and half.
1100 pound horse at steady farm work,	12 lbs. oats 12 lbs. timothy and clover, half and half.
1000 pound driving horse at steady work	12 lbs. oats 10 lbs. timothy hay.
1000 pound driving horse idle	3 lbs. oats 14 lbs. clover, vetch, or mixed hay.

**METHODS OF FEEDING IN DIFFERENT PARTS  
OF THE STATE.**

**Willamette Valley.**

Oats are the universal grain for all kinds of horses in the Willamette Valley. The oats in this section are of high quality and as cheap as any other grain, so there is no particular reason to use anything else, although occasionally a little bran is used for its physical effect. Practically no barley, wheat, or corn is used. The hay in the northern part of the valley is largely clover, mixed with various grasses, such as timothy, cheat, mesquite, and miscellaneous grasses. In the southern part of the valley the hays are more largely vetch, mixed with oats and sometimes wheat or rye. Cheat is fed to a slight extent throughout the valley, especially on the lower, wetter lands, where the cheat grows to fairly good advantage. Mesquite is sometimes used, but not to any great extent, since it is not a palatable hay. The grains used in the Willamette Valley are as good as can be found in any country, but the hays are often of only second-grade quality, since they are more or less poorly cured and mixed with weeds and other undesirable material.

**Southern Oregon.**

In the Umpqua Valley horses are fed approximately the same as in the Willamette, but in the Rogue River Valley conditions are quite different. There is not enough grain grown to supply the demand, so there is a good deal shipped in. Both oats and barley are used, the barley being shipped from California. Alfalfa is the chief hay, although some wild hays of various kinds are used.

**The Coast Region.**

In the various valleys along the Pacific Coast little or no grain is raised. What little concentrates are used are mill feed of various sorts together with oats and barley shipped in from the outside. Under such conditions the horses are fed almost altogether on hay and pasture. The hays are made from various forms of wild grasses, including quite a little mesquite. A considerable amount of clover is also raised, both of

native and domesticated varieties. Practically no vetch or grain hay is raised in these localities, with the possible exception of a little grain in Coos County.

#### **Columbia Basin Wheat Belt.**

In the great wheat-growing region of the Columbia Basin rolled barley is the standard grain, with a decided preference for the barley which has been steam rolled rather than that which has been rolled or ground dry. In a few localities oats are used, but not to any great extent. The almost universal hay is wheat hay, varying from wheat cut in the dough stage to ripe wheat headings. Where the wheat headings are used, practically no grain is required; in fact, with any form of good wheat hay the amount of grain required is rather less than normal, and on this account the farmers pay a good price for such hay. This combination of wheat hay and rolled barley cannot be considered a strictly first-class ration, and as a consequence the losses from founder, impactions, and other digestive disorders in these regions are far in excess of the losses in other localities where different feeds are used. These rations may in practically all cases be materially improved by either one of two methods: first, by giving one feed a day of alfalfa; second, by using from one-third to one-half bran along with the barley. In practically all cases such a change would not only result in a better ration, but would lessen the cost.

#### **Irrigated Valleys.**

In the irrigated valleys of Wallowa, Union, and Baker Counties, oats is the common grain, although barley is sometimes used. The favorite hays are timothy, timothy and clover, and alfalfa, with a common, but in nowise universal, preference for one of the first two. A small amount of grain hay is also found in these localities. In the smaller irrigated valleys scattered throughout the central part of Eastern Oregon, we find alfalfa the chief feed. In some of these localities they raise a little grain, either oats or barley, but for the most part grain is very scarce and the horses are largely fed on alfalfa hay without grain. Any possible evil effects of this excessive amount of alfalfa is apparently counteracted by running the horses on the bunch grass pasture throughout a considerable portion of the year. In the irrigated valley of Harney, Lake, and Klamath counties wild hay of some form is the usual feed, although there is quite a little clover and alfalfa in some localities. Here again very little grain is used.

#### **Range Districts.**

Nearly all of the big stock ranches have at least a limited amount of irrigated land upon which either alfalfa or wild hay is grown, so that the feeding of horses would correspond very closely to that outlined above for the irrigated valleys. In many cases, however, hay land is very scarce and as a supplement to the irrigated meadows some hill land is cultivated and sown to rye, or sometimes wheat or barley. Very little, if any, grain is used on the big stock ranches.

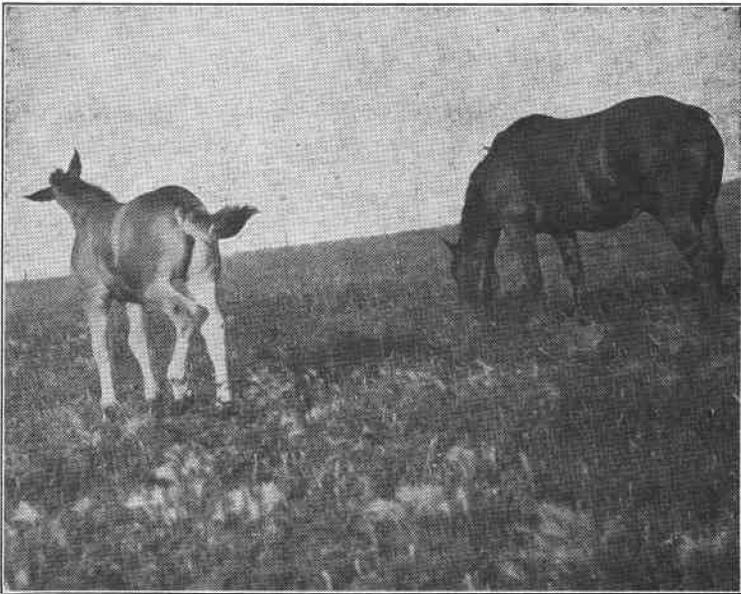
### Homestead.

The homesteads now being taken up in Oregon are largely located on land that is both dry and frosty. Under these conditions rye is of course the best crop, and usually the first move of the homesteader is to sow a patch of rye which is cut for hay for his horses and cows. The horses run out in the sage brush most of the time and when at work are given some of the rye hay. Very few of these homesteaders raise enough grain to thrash, so the horses must necessarily be content with hay.

### THE MARE AND THE FOAL.

#### Season of the Year to Breed.

The natural time for foals to come is in the spring. In a state of nature nearly all foals come in this season. Artificial conditions, however, may make it undesirable for the foals to come at this time. With race horses, and in many cases show horses, the ages are counted from



No. 2. Mare and foal on good pasture. The most successful way of raising colts.

January 1 of the year in which foaled, regardless of the actual time of foaling. In such cases it is necessary to have the mares foal as soon after January 1 as possible. Where mares are idle and the colts are not to be raced or shown, the foals should come as early in the spring as the weather and grass is good. With the work mare, the time of foaling should be adjusted to the seasons where the least loss of working time will result. It must be borne in mind always that the mare can do more

work while pregnant than while suckling the foal. Especially is this true where the foal is only a few days or weeks old. If the heavy work of the farm comes in the spring, therefore, the foal should not arrive until after the rush is over, so that the mare may be turned out to pasture as soon as the foal is dropped. Fall foals are not as desirable as spring foals, but with good feed may be raised very successfully. Fall foals are advisable if the work is lightest at that season or if the mare has failed to breed in the spring and has to be bred in the fall in order to avoid waiting another year. In this State the foals on the farms are nearly all dropped in April, May, and June. A very few are dropped in March and July. For early colts the first part of April is the popular time. Perhaps one-fourth of the colts come before April 15. Where the mares are worked, however, most of the colts come in June.

Mares tend to breed more readily in the spring than in the fall or summer. Good care and an increase in feed, so as to start the mare to picking up a little, will often cause her to breed in the fall where she otherwise would not.

The average period of gestation in mares is commonly placed at 11 months, or 340 days, but they may vary somewhat from this. They should come within ten days of this time, but many healthy foals are produced a month earlier or later.

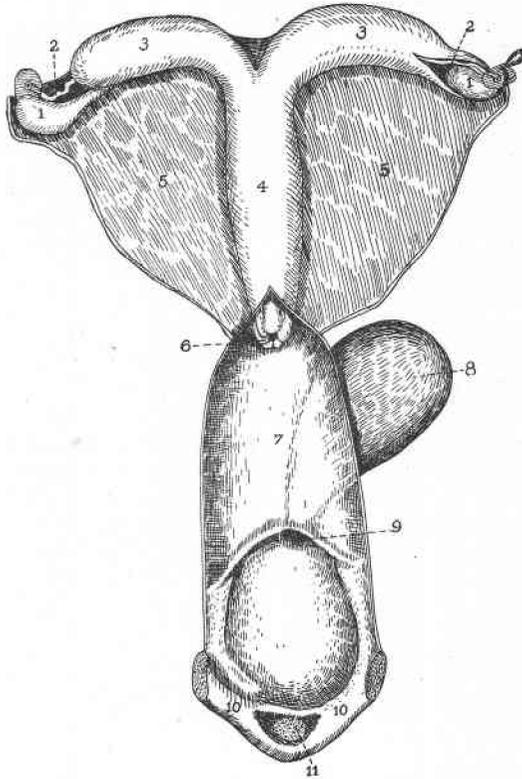
Two-year-old fillies that are well grown may be bred, but it is generally considered better to wait until they are three. If they are to be kept for brood mares they should by all means be bred by the time they are three, and not later, since early breeding tends to make a mare a more regular breeder. Some of the English breeders like to breed the two-year-olds because they do not work them at that age. Then they let them rest one year. With this year's rest, it is claimed that the mares will grow just as well as if bred regularly beginning at three, and the early breeding makes them better breeders. This has not been proved by authentic experimentation.

The most prolific age for brood mares is from two to eight years, although many mares continue to produce good colts until twenty. Most mares over fifteen are not worth keeping as brood mares, because too often they miss bringing a colt. Old mares that have never produced a foal will not usually conceive and are not worth breeding. Certain unscrupulous breeders, however, take advantage of stallion owners, where the stallion is stood for so much to insure foal, and bring these old mares that they know are not in the least likely to conceive.

Barrenness is also often met with. Mares may be barren because of imperfectly formed sexual organs, diseases, or from having the neck of the uterus stopped up with mucus. The latter is very common and can be easily remedied by inserting the hand in the vagina and cleaning out the opening by working the first and second fingers into it. The hand should always be perfectly clean and should be lubricated with soap, vaseline, or slippery elm bark. Where any diseased condition is suspected, the hand should be absolutely free from any breaks in the skin such as cuts, scratches, hangnails, etc. Barrenness due to other causes than mucus are more difficult of treatment and demand veterinary attention.

**Breeding.**

The mare usually comes in heat on the ninth day after foaling, and after that at more or less regular periods of from 18 to 21 days. The presence of heat is indicated by the passing of a white viscous fluid and by a nervous, excitable condition. If she is in the pasture with other mares or geldings they will be riding her. Some geldings have none of their sexual instincts left, while others have more and will devote a good deal of attention to mares in heat. These signs, however, should not be



Generative Organs of a Mare Viewed from Above.

1. Ovary. 2. Fallopian Tube. 3. Uterine horns. 4. Uterus.
5. Broad ligament. 6. Neck of Uterus. 7. Vagina. 8. Urinary Bladder.
9. Mouth of Bladder. 10. Vulva. 11. Clitoris.

relied upon, as a mare may pass through several periods of heat without making any apparent signs, even though she be worked every day and the driver be watching to tell when she comes in. The only safe way is to try her with the stallion. She will soon show signs when teased by a stallion if she is in heat. Some mares show signs of heat as soon as brought in the presence of a stallion, while others may have to be teased a bit. As the mare remains in heat for several days it will be

necessary to try her only every four or five days; in fact, once a week is the more usual time where the mare is not on the same farm with the stallion. Where the stallion is "peddled" around the country he should visit the mare every week until bred and then should come again about 18 days later. If the mare shows no signs of heat at this second period she is probably with foal, but for safety should be tried again every week for about four weeks after that. Where there are a number of mares on the farm, the stallion should come regularly at least once every week. It is of the utmost importance that the stallion come at the proper time. Stallion men are notoriously slipshod; they will often visit a farm twice, finding no mares in heat, and then when they are practically sure of catching them on their third visit, will come three or four days late only to find that the mares have been in heat and gone out again. The man who owns his stallion has a considerable advantage over the man who depends upon the neighborhood "stud-horse."

Mares should be bred only once at each period of heat, and the stallion should breed only two mares a day, preferably only one. To avoid any possible danger of the mare kicking the stallion, the breeding hobbles should be used. These are made in various ways, but consist in general of a collar around the mare's neck with two ropes from the collar between the front legs and attaching to straps buckled around the hind legs at the hocks. They are sometimes fastened at the pasterns, but when so fastened the mare is liable to step over the ropes and throw herself. These hobbles had better be attached before trying the mare, since she will be less nervous at this time and consequently less likely to kick the man who is buckling them on. Always look out for a mare's heels when there is a stallion around. The gentlest of them may kick viciously at this time.

#### Artificial Impregnation.

This is done in three ways: (1) with the breeding bag, (2) with the impregnating syringe, and (3) with the capsule. The object of artificial impregnation is to breed two or more mares from one service of the horse, hence it is necessary to have the mares in heat and at hand at the same time. When a mare is bred the horse ejects the semen, or male fluid containing the sperm cells, into the vagina of the mare from whence the sperm cells pass on into the uterus and from there into the Fallopian tubes where they meet the ovum, or female cell, when impregnation proper takes place. This may not occur for several hours after copulation. The exact time is not known. The mare produces one, or sometimes more than one ovum at each period of heat, while the semen produced by the horse contains hundreds of the microscopic sperm cells, and any one and **only one** of which may unite with the ovum to produce the colt. Thus the horse at each act of copulation produces many times more sperm cells than are actually needed; provided, of course, that he is a normal, healthy horse.

The breeding bag is a rubber bag which is tied onto the end of the penis. When the penis is withdrawn after service, the bag with the ejected semen comes back with it. The bag is then placed in warm

water, 93 to 94 degrees F. A syringe is filled with the fluid and emptied into the vagina of the mare. As only a part of the fluid is used for one impregnation, a number of mares may be bred from this one bag of the semen. The objections to this method are: stallions may refuse to serve with the breeding bag attached; the fluid may become contaminated with germs; and last, the fluid may be exposed to the light and the sperm cells killed. The sperm cells must be kept at the body temperature and light excluded from them. Even then they will probably not live over two or three hours.

With the syringe method the mare is bred in a normal manner; then the syringe is pushed into the vagina and there filled with the semen. It is then withdrawn, inserted into the vagina of another mare and the fluid ejected. This operation may be repeated.

With the capsule method, the operator takes a gelatine capsule in the hollow of his hand, inserts his hand into the vagina of a mare that has just been bred, scoops the capsule full of semen from the floor of the vagina and withdraws it carefully, holding the capsule in the hollow of his hand to protect it from the light and his finger over the opening to prevent loss of the fluid. Then he immediately goes to another mare and inserts his hand with the capsule into the vagina and pushes the capsule carefully on into the uterus. This operation may be repeated a number of times from the same mare. The opening leading from the vagina to the uterus, or womb, is small and may be closed up, so there is always a possibility that the semen injected into the vagina, either by the horse or artificially, may never reach the uterus. With the capsule method there is never any question about this, as the capsule is always inserted directly into the uterus. As a precaution before breeding, however, the hand should be inserted to see that the opening is not closed, and in case it is closed to open it up. Otherwise the hand with the capsule may be inserted only to find the opening closed.

With the syringe, the object is always to push it clear on into the uterus; and in this case it is even more important that the hand be inserted first, as the effort to introduce a hard instrument into an opening that does not exist will not only fail to get a colt, but may injure the mare as well. Sometimes the capsule is used as a precaution where only one mare is being bred. The hand is first inserted to see that the womb is open, the mare is bred, the hand with a capsule again inserted, the capsule filled, and pushed into the uterus. This method is often successful with mares that are otherwise shy breeders. Whatever method is used, the syringe, or anything that comes in contact with either the semen or the genitals of the mare, should be thoroughly sterilized by boiling. The syringe is usually very difficult to keep thoroughly sterilized, unless made entirely of metal.

There is another method, combining the syringe and the capsule, and known as the Carlson method. In this case, the semen is withdrawn from the first mare with a special syringe with a long flexible point made of soft metal. The hand is inserted with the syringe, the point being held in the hand and the body of the syringe lying along the operator's arm. The point of the syringe may be pushed clear on into

the uterus and the point turned down to the floor to gather up the semen. The capsules are filled from this syringe, or the semen may be placed in another mare directly from the syringe. Where the capsules are filled from the syringe, special care must be taken to prevent the sperm cells from being chilled or killed by the light.

The simple capsule system is the easiest to use. The users of the syringe as outlined in the preceding paragraph maintain that in many cases all of the semen goes on into the uterus instead of being left partly in the vagina. This being the case, the flexible tube syringe is the only possible instrument for getting it out. Where the capsule is held in the hand it is impossible to reach the uterus. Many breeders who have used the simple capsule method, however, maintain that the cases where all of the semen is ejected clear on into the uterus are too few to be considered.

Artificial impregnation has proved very successful and will doubtless be more used in the future. There is nothing in the idea that the colts will be inferior. Moreover, there seems to be just as little in the idea that the semen can be shipped all over the country and kept for an indefinite time. The Oklahoma Station, which has made some tests along this line, has found that the sperm cells could not live more than three hours. They also found that there were from 40,000 to 50,000 sperm cells in 12 to 15 drops of semen from a good, healthy horse, but that the number was very greatly reduced by frequent service and that hardly any would be found in the case of young horses heavily used.

#### **After Breeding.**

The mare, after she has been bred, should be kept rather quiet for several hours, but after that she may be put to work as usual. There is a lot of nonsense about the care of the pregnant mare. The best thing she can have is steady work with three good meals a day. If there is no slipping, straining, or jerking, and the mare keeps up in condition on good feed, the work is probably not too hard, provided it be steady. The mare should not be worked so hard that she will become run down in condition on good feed. If there is any slackening in the work, it should be about the fifth or sixth month, since it is at this time that the foetus is making its most rapid growth. During the last three months of pregnancy the mare can do a lot of work without injury. If the mare is doing steady farm work, such as plowing, harrowing, etc., it will not hurt her to work up to the time she drops her foal. Under these circumstances she will usually be in good, strong, healthy condition, and her digestive system will be in good working order. Parturition is a severe physical strain and in order properly to withstand it the mare should be strong and vigorous. If taken out of the team a week or two before this occurs, the change of surroundings and of feed may upset her system and leave her softer and weaker than if she had been at work.

The place where the mare foals is very important. The disease known as "naval disease" or "joint disease" kills hundreds of colts every year. When they are a few days old the joints swell, the legs become

stiff, and the animal usually dies. A veterinarian may be called at this time, but there is very little hope of the animal recovering. Fortunately, however, the disease may be prevented. It is a germ disease, but not due to any certain germs but rather to a number of putrefactive organisms. The germs that cause decay and rotting around the barns, straw stacks, and manure piles are the ones that cause the trouble. They enter through the raw naval cord. If the colt is born and kept for the first few days in a place where these germs are not present the disease will not exist. The best place, then, is in some grass lot or pasture where there are no sheds, barns, manure piles, or old straw stacks. The next best place is in a box stall that has been thoroughly disinfected and cleaned. The whole stall must be cleaned perfectly, new bedding put in, and the whole thoroughly sprayed with some good disinfectant. If possible, have two stalls prepared, and when the foal arrives, wash the mare's udder and hind parts with some non-poisonous disinfectant, such as sheep dip, and transfer the mare and foal to the other stall. The first stall can then be cleaned out and prepared for the next mare. If the extra stall is not at hand, wash the mare's udder as indicated, clean out all the blood and after-birth, and disinfect again.

The colt's belly and cord should be washed twice daily with some disinfectant; or the cord may be washed and the stub end cauterized with some caustic, and then treated with some drying powder. Formerly it was thought well to tie the cord, but it has been found that this had a tendency to keep a jelly-like substance within the cord, forming a good medium for the action of bacteria. The proper treatment is to use something that will tend to dry up the cord as quickly as possible, and at the same time keep out bacteria. Remember that the object of the whole process is to prevent putrefactive germs from entering the raw naval, although it may be that the germs entering through the mouth may cause the same effect. Scours is another disease that often comes from getting disease germs into the system.

Now is the time to rest the mare. The working of the mare after foaling should be delayed just as long as possible, preferably until after weaning. If kept up, the mare should have plenty of nourishing, rather laxative food, except for the first day or two, when she must be fed lightly. Avoid medicines and physics. If any serious condition arises call a veterinarian. The best place, however, for both mare and foal is out in a good, rich pasture, unless the weather is extremely bad, and even then they should be kept in just as little as possible. Scours and other digestive troubles are the chief dangers at this time and they are seldom contracted in the pasture.

### **Weaning.**

Weaning should be put off as long as possible, which usually means until rather late in the fall. If it is necessary to work the mare, the foal should be taught to eat grain as early in life as possible. As soon as the colt seems to be able to live well on grain and hay, or pasture, it may be weaned. If a colt is allowed to run until about 6 months old, it will eat grass and hay without teaching, and if put in a separate lot or pasture and given all the first-class vetch or clover it wants, it will do very well.

Grain is a great help, however, and very few colts come through their first winter in good shape without grain. They should be taught to eat the grain before weaning and then weaned as soon as they have developed a good, heavy appetite for the grain and hay. Timothy is good if supplemented with a rather heavy nitrogenous grain ration, such as bran and oats, with perhaps a little oil meal. Many farmers are afraid of getting their colts too fat, but there is very little danger of this during their first winter. In fact it is difficult to get a colt fat in the six months that follow weaning.

### **Halter Breaking.**

Halter breaking should be done just as soon as possible. A few minutes work while the colt is still running with the mare will suffice for halter breaking, and be easier and better than the same number of hours when the colt is two or three years of age. The chief advantage of halter breaking early in life is not that the task may be done with less work, but that the colt may be broken so that he can be handled in any way desired. Dozens of crooked legs and deformed feet have been due to the fact that the colt was not halter broken. Why? Because the owner, though he saw that the foot was going wrong, did nothing, since the colt was unbroken and practically unmanageable.

### **Trimming the Hoofs.**

Trimming the colt's feet is a task too often neglected. The horn grows out and part of it breaks off, making the foot sit on the ground unevenly; thus as the bones are soft and cartilaginous at this time, a crooked leg or deformed foot results. This may be avoided by trimming the hoof occasionally, so that it will sit level. To do this, pick up the foot and trim off the surplus horn with a pair of hoof trimmers, a heavy knife, or a rasp. Round off the edges so there will be less tendency for the hoof to break. Handle the colt gently at first, and if he struggles to get his foot down, talk gently to him and pet him, but do not release the foot. If he gets his foot away a few times he will get the habit and will always make you trouble in handling his feet, either for shoeing or for trimming.

A common method is to stand the colt on a board floor and trim off the surplus horn with the foot flat on the floor. One fore foot is tied up to make him keep his other foot on the floor. In working with the left hind foot, tie up the left fore foot; and with the right hind foot, the right fore foot. In using this method the horn is cut with a mallet and chisel. This is a quick and easy device adapted to vicious horses; but the operator can not do as smooth a job, and often has difficulty in telling just where to cut, since he has to guess at the position of the sole. In buying trimmers or any instrument for hoof cutting, get only the best, for the poorer ones will probably not cut at all.

## THE MANAGEMENT OF YEARLINGS AND TWO-YEAR OLDS.

Plenty of good pasture, clear water, a shed for shelter, plenty of bright, legume hay in winter, and as much oats as you can spare,—this is a program that makes for an ideal management of yearlings and two-year olds. Colts should have a shed for shelter, but should not be tied up in a barn, or confined in a barn lot. Colts should have the run of a large field or pasture the year round. In the yearling stage, especially, they should get plenty of feed, otherwise, they will be considerably stunted in their growth.

### **Castration.**

Castration is usually performed when the colt is one year old. If the animal is under-developed in the neck and fore-quarters, however, castration is sometimes deferred until after the second year; but there is less danger of losing a colt by castration at a year old than at two years old or over. Unless colts are castrated, moreover, they usually have to be separated from the other horses as early as the second winter, as they become an intolerable nuisance, although they are not usually capable of getting colts until the second spring.

### **Breaking.**

There can be no hard and fast rule for the breaking of colts. The complete plans and systems of horse breaking, that are offered by many, are useful only as suggestions that may be applied as occasion arises. No two colts are exactly alike; what applies to one will not of necessity apply to the other. Not only do colts differ in their natures, but in their value, and the work for which they are intended, factors which all have a bearing upon the method to be employed in breaking. For instance, in breaking a fine driving or saddle horse, the development of a good mouth is a most essential point, while in the breaking of drafters, farm horses, cow ponies, and the like, little attention is paid to the mouth other than to get the horse bridle wise.

While we maintain that there is no set rule that will always apply, there are certain precautions that are to be followed in all cases. There are also many tricks and appliances, which, if known, may be used upon such occasions as the reason of the horseman may dictate. The horse breaker must be a man of resource, having a score of ideas in his mind to be used as needed; but depending very largely upon his own inventions.

Of the general precautions, the first is: never let the colt get the drop on you. Many horsemen tell you that the secret is to let the colt know that you are the boss. If that is what you really are, the colt will find it out soon enough. Breakers often make the mistake of giving the colt to understand their mastery by forcing him to take a lot of abuse and cruelty, and then, in some unguarded moment, allowing him to get the upper hand. Horses act largely from force of habit. They do a

thing a few times, and then keep on doing it, whether there is a reason for it or not. The horse also has a very keen memory, but very little real intelligence. He has lots of mettle, a fine physique, and a high-strung nervous organization, but very little reasoning power. All of these things must be borne in mind while breaking colts. Great care must be used to see that all ropes, halters, harness, etc., are so strong that there is absolutely no danger of breakage. Only the very heaviest and strongest harness is suitable, and very few halters, unless made for the purpose, will hold a mean colt.

### **Catching the Colt.**

If the colt has never been handled in any way, the best method to catch him is to run him into a box stall in the barn, and there slip a lariat over his head by means of a long stick, such as a rake handle or short fishing pole. Throwing the rope on, is sure to frighten the colt and make him worse to handle, and the more he is handled the worse he is to catch. With the other method he hardly knows when he is caught. Were a strong box stall is not available, he may be roped in this manner in a small corral, or he may be run into a corner. He will fight a good deal when first caught, but will soon quiet down, or may be choked down with the lariat. The lariat had best be made of hard-twist rope about 7-16th inch in diameter with a brass honda braided in the end. Common rope is too soft to work well and is not nearly stout enough. Do not attempt to use a lariat without a metal honda as the noose will not work easily and will not loosen when the rope is slackened. Hard-twist rope of the size mentioned will hold any ordinary horse, unless the noose gets back around his breast.

### **Halter Breaking.**

After the colt quiets down a little, snub him up to a stout post and put a halter on him. It is best to handle him some while doing this. A few oats while breaking will often work wonders. Fit the halter carefully and have on it a rope about 20 feet long. Leave the lariat in place, seeing that the noose fits snugly around the throat and that the honda is on the off (left) side. Have one man hold the halter rope and another the lariat. The man with the lariat should have a good buggy whip. Now let the colt out into the corral. Be sure the corral is so strong that he cannot possibly get out. Two men can handle a colt with the lariat and halter as long as the rope does not get under his legs, but if it does, he is likely to get away if out in the open. Now let the man with the halter try to lead him. The second man can touch him up with the whip if he does not want to go, and hold him back with the lariat if he tries to get away. If handled in this manner, the colt can be made to lead and will learn very rapidly. If the colt has been schooled a little in catching, he will often lead at first trial by pulling slightly on the lariat. In most cases, however, it is better to have the man with the lariat follow behind with the whip. After the colt leads pretty well, the man behind can gradually work around to the side, and then to the front; since the colt that is taught to lead when there is a man following behind will often not lead otherwise.

Pure-bred colts intended for show purposes should always be taught to lead up beside the leader. Other horses should be taught to follow along behind, but, of course, keeping the rope loose. Do not let the colt get the very bad habit of being dragged along.

### **Breaking to Stand Tied.**

Before tying the colt see that the halter is especially strong. No ordinary halter is strong enough to hold a good, healthy colt of two years. Even a yearling may break a heavy 1½-inch halter. A very heavy leather halter made for the purpose is the proper thing, but when such is not at hand use a ¾-inch rope, passing it through the ring of the halter and tying it around the neck with a bowline knot. Even if the halter is strong enough to hold the colt, it is not safe to tie and leave him, for he may pull hard enough to kink his neck or even kill himself. There are various ways of tying colts and "halter pullers." When the rope is passed around the buttock it easily gets out of position and will then be useless or even dangerous. The rope around the body will not get out of position, but the horse may get his foot over it and throw himself or burn his pasterns. The other method is to use a good, strong outfit and tie the colt to a beam or ring higher than his head. This method is not widely known, but in the experience of the writer has been very successful. Methods of curing "pullers," having for their object the infliction of pain, have not been very successful; since the horse, once in the habit, will often give himself serious injury before giving up. The methods outlined above are all in use for these cases. The main thing is to tie him so that he cannot get away or hurt himself. If this is kept up long enough, a cure will be effected, the length of time required depending upon the age of the horse and the time he has been addicted to the habit. Practically all colts will pull back more or less when they are first being broken, but if they are **always** tied so that they cannot get loose there is no danger of their becoming pullers. These precautions of tying need not be kept up very long if the colt never gets away. The habit of standing tied soon becomes fixed, and a string will hold him, but if he gets loose once or twice it may be several months before it is safe to tie him in the ordinary manner. It is often a good plan to keep a colt loose in a box stall until he gets used to being confined.

### **Breaking to Work.**

Handle the colt a good deal before trying to work him. Get him used to being harnessed and saddled. When you hitch him up be sure that the harness is strong enough so that he cannot possibly break it, for you do not know what he is going to do. Do not be lulled into a feeling of security because he goes all right the first time. With care and judgment almost any colt may be ridden or driven without trouble the first time, but about the third or fourth time there may be "something doing." No colt with any spirit is going to give up without a struggle. He may seem amused or even pleased at the first performance, but sooner or later will make a fight. The seriousness of the trouble will depend a good deal upon the horse, but perhaps even more upon the position you have him in. If you have him on good ground and your rigging is strong and you

can force him to do what you want to, there will be little difficulty; but if your harness breaks or you are in some dangerous place where you have to get out the easiest way possible and thus have to give in to him a little, then things are serious.

This leads to the unalterable, never-to-be-violated rule: Never ask the colt to do anything that you cannot make him do in case he refuses. The temptation is often strong to try something that you cannot make him do "just to see if he will do it." After he has been worked a while and you have always been victorious and he has "got the habit" some chances may be taken, but the fewer the better. Colts require a good deal of care in their handling for at least a year, and superior pullers are seldom developed in less than three years.

Some horsemen, knowing the necessity of a struggle at some time, think it better to have done with it the very first time; but this is a doubtful policy. The green colt is easily frightened, and what is intended to restrain him or punish his obstinacy, may scare him so that he has no idea of what is wanted. He thus not only becomes harder to handle, but fails to learn the desired lesson. On the other hand, if he is treated more gently, he may become thoroughly accustomed to the bit and harness, or saddle, before making trouble. He may also learn to guide by the reins and to know the meaning of the word "Whoa." When this is the case he may be mastered with little difficulty, if the outfit is strong and efficient.

#### **Breaking Single Drivers.**

High-class, single drivers are broken to a strong cart and never worked double at all. This requires plenty of time and special management and equipment, since it is quite difficult to manage a colt to a single cart. In this method of breaking colts, special carts are used. These carts are very strong and have extra long shafts, so that the colt cannot do any damage by kicking. An extra length must be attached to the traces so that they will reach the singletree. An extra heavy harness is also used. Since there are very few single harnesses made strong enough for this purpose, they are usually made to order. A kicking strap is also used. This is a heavy strap running across the hips and buckled to the shaft on each side. This will prevent the colt from kicking out of the shafts. A crude cart may be made with an old buggy axle and wheels, with long poles for shafts, and the harness may be worked over from a heavy double harness. Few people, however, except those dealing extensively in fine drivers, have need for these breaking carts. The time required with the breaking cart to break a horse to work single is much longer than with any other method. Of course, where the horse has been well broken double he will make little more trouble when hitched single, but even then should be hitched to a strong breaking cart and never risked to a light rig or buggy.

#### **Breaking Double.**

Horses for all kinds of general work and ordinary driving should first be broken double. Unless it be with the highest grade of horses, it is easier and just as good to break double first. For this purpose, all that

is required is a good, stout wagon with a brake, a strong set of breeching harness, and a gentle but quick-moving horse. In breaking teams, however, the trained horse is often dispensed with and two colts hitched together. In either case, the colt should be tied with the halter to the other horse's hame so that he cannot get away. It often happens that a colt gets out of the traces and whirls around with his head toward the wagon. If he does not do this, he may lean on the outside trace until he falls over it. In either case, trouble arises that may be serious. Both of these accidents may be prevented if the rear end of the horses be tied together by the breeching. Take a stout halter rope and connect the inside rings of the breeching so that they will be about one foot apart. It is safer to wrap the rope around the straps than to tie to the rings. Sometimes an extra line is put on the colt so that he can be held better. Before hitching to the wagon, whether single or double, drive around a while just in the harness. This should be done inside of the corral until you are sure that everything is going to be satisfactory. Then go out on the road, and finally hitch to the wagon. This driving in harness, however, can not be done safely with a team, unless the breeching are tied together as mentioned; but if your colt is thus tied, both front and rear, to a good, gentle horse, your mastery is almost complete. When breaking a colt single, the practice of driving in harness without the cart is almost universally followed. In this case, be sure that your harness is secure, and even then do not take the colt out of the corral until you are sure that he will go all right. Have the lines extra long. The common lines found on buggy harness are neither long enough nor stout enough. The most important thing to do is to run the lines through rings fastened to the harness half way down the sides. The backband of the ordinary buggy harness may be used by tying the shaft tugs and running the lines through them. This is done so that the lines will always be around the horse's buttocks, and you can thus prevent him from whirling around with his head toward you. If the lines are on top of his back the more you pull the more it pulls him away from you. You will also need a good whip. A buggy whip is the best. Be on the lookout, for he may back up and kick you.

#### **Breaking to Ride.**

Some people prefer first to break a horse to ride, even though he may never be intended for a saddle horse. The object of this is to gain complete mastery over the animal with less trouble and risk than by the other methods. No outfit is needed other than the saddle, bridle, and spurs which are at hand on any farm. Many beginners think that they had better leave off the spurs when starting a colt, but this is a mistake. They are a necessity if the colt ever refuses to go. Spurs excite a horse less than the swish of a quirt, and are infinitely more effective. Touch him lightly at first, until he learns what is wanted. Then prod him harder if he makes trouble. The animal should not be allowed to buck, any more than he should be allowed to run away. "Once a bucker, always a bucker." To avoid bucking, requires that the animal be handled some before he is ridden. Give him a little oats in a trough and handle him while he is eating and after he is through. Rub his legs and work all

over him. Do not stand off and touch him with the ends of your fingers, but rub right up against him. Put your arms over his back and put your weight on him. If he starts, pet him a little and try again. Repeat this again and again, and pretty soon you can get astride of him. Get off and on again, and repeat. With this method you can in an hour wallow all over an ordinary halter-broken, farm colt, even though he is a spirited horse.

Then try the saddle. Put it on and take it off. Cinch it up and uncinch it. Twenty minutes of this will do wonders. Now bridle the horse and lead him out. Put your weight on the stirrup a few times. Then get on and off again, repeating several times. Let him stand a bit while you are mounted. Remember that while you are trying to break without his bucking, he may buck, and that it is then your job to stay on; so be prepared. You may now let him move about the corral a little. Then lead him away from the barn, always turning him toward home before getting on. He will walk back to the barns with you on him as if he were an old plow horse. Then turn him the other way. This time it would be better to have him out in the field out of sight of the barns and other horses. In fact, he should be out of sight and hearing of the other horses at all times while breaking. You will now have no trouble and will find that you can ride your horse around any way you please. Do not ride him over a mile or two the first time. Do not be fooled because he rides like an old horse the first time. You will have to scrap with him before many times, but he will be used to you by that time and you can handle him all right, although you may have to spur him pretty hard and he may jump around and try to buck a little. Of course, there are many men in the West who would call this a cowardly way of doing, but we are discussing the matter from the standpoint of the good of the horse and not with the idea of running a Wild West show. The practice of roping a horse, saddling him up, and riding off, is not breaking; it is simply riding without breaking and the horses so handled rarely get tame enough so that they can be ridden by an ordinary man. The man who handles cattle does more to improve the ease with which a horse may be trained than several days riding on the road. It is surprising with what readiness a colt takes to handling of cattle.

If the colt is not intended for saddle purposes, the breaking need not be carried this far. At any rate, he will not make much trouble when it comes to working him, and breaking him to ride takes very little time. Four or five evenings after supper in the summer time will do the work. Heavy drafters will hardly need to be ridden, but light horses of all kinds will benefit by it. The question comes up: "Will it hurt a horse both to ride and drive him?" We think not, provided the animal is thoroughly familiar with the saddle first. If anything suffers, it will be his riding qualities rather than his driving qualities. Heavy work injures a horse for either riding or driving, for it tends to make him stiff and slow; but even in this case, the effect is more temporary than permanent.

#### **Severe Methods.**

Famous horse trainers who have made a reputation for handling the most vicious horses use very severe methods for gaining mastery of the

horse. These are usually some sort of rigging on the front feet, so that when the horse makes trouble the front feet can be jerked from under him. Rarey and Gleason used these tackles extensively, and many different rigs are known as "Rarey tackles." The principle is the same in all cases; that is, to throw the horse by jerking his front feet from under him. That these methods will master a horse is unquestionable, but sometimes they completely break a horse's spirit; and a colt which would otherwise have been spirited and courageous will show no other life than an occasional outbreak of ill temper. With "outlaws", as we term horses which have proved untamable, these methods may do little harm, but they should not be risked with valuable colts. There is also even greater danger of killing the horse in the operation, or at least of ruining his knees. It is always recommended that the horse be put on soft ground for this sort of handling, and some knee caps or pads are often an advantage; but even then there is very great danger.

Another system of handling bad horses is by means of what is commonly called "War bridles." These are severe bridles made of 5-16-inch rope and put on in such a manner as to cause severe pain in case the horse tries to get away. Several of these will be illustrated in class. These rigs are much less objectionable than the Rarey tackles, but less effective and ordinarily not needed except in the worst cases.

Strapping up one foot is a trick commonly used to tame mean horses. One front foot is raised up and strapped tightly to the forearm with a heavy strap. The breast strap off of the ordinary farm harness will do very well. The colt will be helpless with one foot tied and may be handled without difficulty. Where a colt gets vicious when first caught and refuses to be touched, this method will work wonders. As soon as the colt gets tired and sullen the foot must be let down at once. With all severe treatments there will come a time when the colt will give in. The fire will leave his eye and he gets sullen. Then is the time to ease up on him or he will sulk and nothing will move him.

#### **HANDLING PURE-BRED DRAFTERS.**

The large breeders usually have extensive equipment. This, combined with their extensive advertising, puts considerable expense on their stock. The chief advantage of conducting the business in this manner is in marketing. The large breeder with the large equipment can usually sell his stock more readily and at a higher price than can his smaller competitor; but on the other hand, his expenses are so much greater that his margin of profit may not be larger. The surest way to profit in pure-bred drafters is to engage in some line of conservative farming that requires a few work horses and then have these work horses pure-bred mares. If the farm work requires, for example, a half dozen geldings, eight or ten mares will do the work just as well and raise colts besides. Out of ten mares there will be three or four that will not bring colts, but of course they will do just as much work as geldings. Those that do bring colts will do nearly as much, especially if the foaling time be so arranged that there will not be much work to do during the first few weeks of the colt's life. The work of the mares on the farm will pay for

their keep and interest on part of the investment, so that the colts will be nearly all profit.

The beginner had better not buy even as many as ten pure-bred mares at first, but get one or two pure-breds and let the rest be grades. Then as his judgment and experience increase, he can buy more. At any rate, buy good mares. They cost little more now than the poor ones; but the indications are that in a few years there will be an over-supply of the latter, while the kind that are smooth, well made, and sound, will bring large prices.

The care that a pure-bred mare requires is not essentially greater than that required by a grade, but as the pure-bred is more expensive a little carelessness will cost the owner much more. Pure-breds do not need pampering. Three good meals a day and plenty of exercise is all that they need. There are but two ways of exercising a mare; namely, to turn her out in the pasture, and to put her in the harness and work her. She should be doing one or the other all the time. Mares and colts should have shelter to run under in bad weather; but they need be taken in only to be fed, and this is not usually necessary. As for feed, grain is not necessary where there is plenty of good pasture in summer and bright legume hay in the winter. This refers, of course, to idle horses and growing colts. Where pastures and hay are poor, some grain is necessary. In this case, nothing is better than oats. Part bran is also good. The general treatment outlined above in the chapter on raising the colt applies to pure-breds as well as to grades.

### Fencing.

Fencing is important with all kinds of horses, but especially so with pure-breds. The best fence is a good, woven-wire fence. Board and rail fences are open to various objections, but if well made are all right so far as the horses are concerned. Barbed-wire fences are dangerous and should be avoided wherever possible. The greater part of the danger from barbed-wire fences comes partly from improper construction and partly from carelessness. The wires must be stretched tight, and there must be no sharp corners and blind lanes in which a horse may be forced by a vicious companion. Similarly, large pastures are much less dangerous than small ones. Barbed wire will not do at all for small lots and corrals. Perhaps the greatest danger lies in having the bottom wire too low. Most of the very serious cuts are caused by the horse pawing over the bottom wire. In this respect three-wire fences are much better than four wires. Best of all is a two-wire fence with the lower wire about 2½ feet from the ground and the top wire 1½ feet above that. If this kind of fence is carefully made, and there are no bad corners, it is comparatively safe for a horse, but it is of very little value, of course, for any other stock. A three-wire fence with the bottom wire 2 feet from the ground will hold cattle fairly well and is not bad for horses, but where the bottom wire is closer to the ground than 2 feet, the danger for horses is so great as to be practically prohibitive for pure-breds.

### Buying the Stallion.

There are not a dozen stallions in the State of Oregon that are worth \$3,000, yet that is the standard price. Any good horseman with \$1500 in his pocket can go east and buy a pretty fair stallion, paying all his traveling expenses, besides freight on the horse. Furthermore, \$2000 at the barns of the importers, whether east or west, will usually buy the same horse that the traveling agent will sell for \$3000. American-bred horses can be bought for much less than imported stuff, since there seems to be some sort of magic about the word "imported" that people who know no better are willing to pay for. With the same individuality the chances are that the American horse will prove the more useful, since he is thoroughly acclimated. It is true that the European countries have horses that are better than our horses, but the great majority handled by importers are not of that class. There is little doubt that many horses have been sold in Oregon as high-grade, imported stuff that were only culls, or were unsound, or that were even American grades. In fact, there is some pretty good evidence that Oregon-bred grades have been sold right in our own state as imported and registered animals. The victims even write articles to the papers telling how well they have been treated. The prices paid for stallions in Europe are a difficult thing for the uninitiated to learn, but, according to the best information the writer can obtain, \$1,000 buys a very high-class animal. Most of the imported horses sold in Oregon do not cost over \$500. The expense of importing is \$200 or more, but of course this varies a good deal. Small shipments cost more than large shipments. The length of time the buyer spends in Europe adds greatly to the expense. If the horses are picked up one or two at a time on the farms, the importer's expense will be larger than if the horses are purchased at wholesale from one of the large dealers who make a specialty of gathering horses in large numbers at central points for the benefit of the American importer. The larger American buyers are favored by the European horsemen over the stranger. Many of the best breeders save their finest colts for favored and regular customers. Such big dealers as Crouch & Sons, or McLaughlin Brothers, make a big display at the American shows, and thus make it worth while to their big European breeders to keep fancy stuff for them. About the only chance for a stranger to get good horses is to go to the small farmers. The cheap kind, however, can be bought by anyone and anywhere. Stallions are usually shipped from New York to Portland by express, at a cost of about \$1500 for a car of 16 head. The freight rate for each car is only \$478, but the slow time and the smaller number that may be put in a car make this an undesirable method of shipping. American-bred horses can be purchased at auction or at private sale from the large dealers and breeders who advertise in the leading live-stock journals. In the states of the middle west one can often pick up a stallion from some farmer, but it requires some knowledge of the country to find these smaller breeders who do little or no advertising. Sometimes a farmer may have only one or two pure-bred mares, yet these may be bred to a high-class stallion. Such mares may produce just as good colts as if they belonged to a herd of a hundred. There are, of course,

many older stallions for sale. Stallions are usually kept in the same district only until their filly colts have reached the breeding age. Then they are sold for service in other sections of the country. An eight-year-old horse will be just as good a breeder as he was when a colt, and he has been tried, so that it is not difficult to know just what kind of colts he produces.

### **Pedigrees and Registration.**

In the stallion business perhaps the greatest fakes are in the pedigrees. A "pedigree," in the broadest sense of the word, is a record of ancestry. In common use, however, the term is applied to the published record of breeding and ancestry issued by some association organized for the express purpose of recording and publishing such pedigrees.

All breeds of live stock originated somewhat in the following manner: In some certain country or locality the farmers will gradually develop a specific type of animal. This is usually done without any pre-arranged purpose, being simply an evolution brought about by a common need. The farmers will find that certain strains of animals seem to fit their need better than any other, and will continue to use that strain, selecting the best. In the course of years this strain of animals has been selected for certain purposes and along certain blood lines until it is distinctly different from other animals of the same species; and furthermore, the animals themselves are not only different, but they transmit to their offspring these differences. Generally, about this time, the men handling these animals begin to realize that they have a strain different from others, and perhaps of some real value, and at that time think of designating the strain as a distinct breed. A breed, according to the generally accepted definition, is a race of animals having an alliance by nativity and possessing in common certain traits which are transmitted by heredity. Usually, by the time this particular stage of development has been reached, it has been found that there are a considerable number of animals in the district which are especially good, not only in their own individual merit, but in their ability to transmit that merit to their offspring; and we find farmers taking pride in the fact that certain of their stock have descended from one or more of these more famous animals. This leads to demand that a permanent record be kept of the best animals and of their offspring. Sometimes private parties will take up this responsibility and attempt to put on record the names and ancestry, so far as known, of all the better animals of that breed. More commonly, however, the men interested in these animals will form an association for this purpose, and will employ a secretary to do the work. This secretary then puts on record all of the best-known animals of the breed, and their pedigrees so far as known. The first animals recorded are known as "foundation stock." They are not admitted according to rule, but upon the judgment of the association. All of the offspring from such foundation stock are eligible to record on the books of the association. It is also customary in the beginning to accept for record animals which are largely of the blood of these foundation animals. Foundation stock may be taken into the records of the association for some time, but usually only for a few years, and then the books are closed and no more

foundation stock is allowed to be recorded; but animals having a larger percentage of the foundation blood may be recorded, usually under what is known as "top-cross rule."

#### **Methods of Recording Animals.**

When any animal is sired by a pure-bred male it is said to have one top-cross of that particular blood. If this animal is bred to a pure-bred sire, the resulting offspring is said to have two top-crosses; and if this animal is bred to a pure-bred sire, the resulting offspring is said to have three top-crosses. This process may be continued indefinitely. Most of the associations in their earlier days admitted animals having from three to five top-crosses. Usually females are admitted with one less top-cross than males. In the course of time when the breed becomes well established it is usually considered advisable by the association to discontinue admitting animals under these top-cross rules, and to admit only animals whose sire and dam are both recorded. This means that from this time on absolutely no outside blood can enter. Practically all of the breeds now well known have undergone the evolution outlined above, and have practically all reached the latter stage where only animals from recorded ancestry are accepted for registration. Most of the breed associations were organized in the eighties.

When any animal is accepted by the secretary of the association for record, he is given a name, and a registration number, or, in some cases, is assigned a certain column and page in the records. There is then recorded on the books of the association the name and number of the animal, the date of his birth, the breeder, the owner, and the name and number of his sire and dam. The secretary of the association then issues a certificate to the owner which shows the information given above, and certifies under the seal of the association that the animal has been duly recorded on their books. Such a certificate is known as a "certificate of registration," or more commonly as a "pedigree." These certificates usually furnish, in addition to merely the sire and dam, the other ancestors back for several generations. The names of the animals are in all cases accompanied by their registration number, or by the volume and page of the book in which they are recorded. Where the number or page is not given the ancestor in question is not recorded. In case of grades admitted under top-cross rules, the unregistered dams will have no numbers, although their names will usually appear. Where the animals have been registered in foreign countries the foreign registration numbers will always accompany the American numbers, but will be in parentheses, thus: Napoleon 45434 (55661). Canadian numbers, however, are put in brackets. Some animals are known to be registered in Europe, Canada, and the United States. In addition to furnishing the owners with such certificates of registration, the secretary of the association will publish all such pedigrees issued in a book, which in the case of horses will be called the Stud Book, in the case of cattle the Herd Book, in the case of sheep the Flock Register, and swine the Record. New volumes of such books are published as often as there are a sufficient number of pedigrees to warrant such publication. With our leading breeds of horses there are from 10 to 20 volumes published. With some

of our oldest breeds of cattle there are from 50 to 75 volumes published. These books are furnished to all members of the association, and to such others as care to buy them. It is possible, with the aid of these books, to trace the ancestry of any recorded animal clear back to the foundation stock.

In the foreign countries the breed associations have been evolved in a similar manner, and it is usually customary for the American associations to accept at face value certificates of registration from the breed associations in the country where that particular breed originated. Some of our breeds, of course, originated in America, and in that case there are no foreign associations.

In some few cases there is more than one association recording animals of the same breed. This, however, is comparatively rare.

### **Bogus Pedigrees**

Bogus or fraudulent pedigrees for horses usually come under one of about four classes: pedigrees or certificates of registration issued by associations or companies without recognized standing; certificates or pedigrees issued by recognized associations upon misrepresentations from the owners of the horses; pedigrees which are correct in themselves but do not belong to the horses with which they are associated, the original horse having died and a grade having been substituted; pedigrees which have been changed in the age or description of the horse in order to make them fit some other horse than the original for which the pedigree was intended; separating the American and foreign certificate and selling the original horse with one certificate and a grade with the other.

### **Unrecognized Associations.**

Most of the bogus certificates now current in Oregon come under the class of those issued by unrecognized associations. The following is a list of associations that are not recognized by the Stallion Registration laws of Oregon or of other states, and whose certificates of registration are therefore not a guarantee of breeding:

American Horse Breeder's Trotting Ass'n., 161 High St., Boston, Massachusetts.

American Horse Registry Association, N. J. Harris, Secretary, Des Moines, Iowa.

American Iceland Pony Club, Geo. H. Simpson, Secretary, Wheaton, Illinois.

American Percheron Registry Association, S. M. Heberling, Secretary, La Grande, Illinois.

Belgian-American Draft Horse Registry, A. J. Meyers, Secretary, Lexington, Illinois.

Coach and Draft Horse Association of America, Frederick Wightman, Secretary, La Crosse, Wisconsin.

Hartman Stock Farm Registry Association, Adam Krumm, Secretary, Columbus, Ohio.

International Consolidated Record Association, H. A. Pen, Yan N. Y. Morrison's International Roadster, Des Moines, Iowa.

National Percheron Horse Breeders' Association, D. E. Phillips, (address unknown).

The National Standard Pacing and Trotting Horse Breeder's Association, Thos. C. Parsons, Registrar, 1023-5 Williamson Bldg., Cleveland, Ohio.

The American Jack Register, W. L. Clough, Cedar Rapids, Iowa.

U. S. Horse Register, J. E. Ragsdale, Secretary, Gibson City, Ill.

We are not aware that there are certificates from all these different associations current in this State. The ones common are those issued by the Hartman Stock Farm Record Company; the American Draft Horse Registry; and the American Percheron Registry Association. Most of these companies do not give applications sufficient examination to be sure that the breeding of the horses is what it is claimed to be. In many cases, however, the rules of registration are so lax that even though the business be done on the most careful basis, the pedigrees are no real evidence of pure breeding. Some of the horses registered by these associations are really pure bred, but that is not usually the case. Where such certificates of registration are accompanied by the foreign certificates, as in the case of imported horses, pure breeding may be accepted as reasonably certain. In other cases, especially with the certificates issued by the American Draft Horse Register, no claim is made of purity of breeding. Horses with such certificates, however, are usually sold by dealers as being of the best breeding and the certificates are accepted by the purchaser as evidence of such breeding, although a very brief investigation will show that the certificates do not make any such claims.

Along with certificates of this kind may be mentioned certificates of animals supposed to be recorded in the Percheron Stud Book of America and signed by S. D. Thompson, formerly secretary of that stud book, but numbered above 35912. Mr. Thompson was one-time secretary of this association and during that period certificates signed by him are good, but Percheron certificates numbered higher than 35912 bearing his signature are not good, and the animals are not recorded in the Percheron Stud Book of America as stated by those certificates, since Mr. Thompson has sold his interest in that society and no longer had charge of the stud books. Mr. Thompson did not issue such certificates for a great length of time, but there are still a number of them in this State. Most of these certificates are for horses sired by Percheron stallions, but out of French Draft mares, usually grades admitted under the four-top-cross rule.

#### **Methods of Misrepresentation.**

The practice of selling one horse with the foreign certificate and another with the American certificate does not seem to be extensive, although it can be done very easily. The foreign certificate, of course, is good and if the horse fits the description the buyer usually makes no question as to the breeding. The American certificate also gives the pedigree and states that the horse has been imported by certain parties on a certain date and the buyer usually accepts this as satisfactory evidence of purity of breeding. The only way to make certain in this case is to have both the American and foreign certificates for imported horses.

Selling grade horses with pedigrees belonging to dead animals is a quite common practice. Where the new horse fits the pedigree perfectly as to age, color, and markings, such fraud is very difficult to detect. In a great many cases, however, the bogus horse does not entirely fit the description of the genuine horse and a very careful examination of the certificate will show this discrepancy, or, in case the certificate has been changed in some way to fit the new horse, an examination of the certificate will reveal the forgery. Comparing the certificate with the published stud book of the society will also help to detect such changes, no matter how skilfully they have been made. Such changes are most commonly made in the age of the horse. Changes in the description are less common, since they are harder to make; and furthermore, if the description is nearly correct few people will notice the difference, or if they do, they will think it is but a slight mistake.

Pedigrees obtained from reliable associations by misrepresentation of fact are comparatively common, yet very difficult to detect. For example, when the mare dies before the colt is registered, the owner may register a grade colt as being from that pure-bred mare and no one will ever be any the wiser; or, in case the pure-bred mare does not produce a colt on a certain year, a grade colt has been credited to her. In some cases, however, more than one colt has been credited to a certain mare for one year. Such cases are detected only by a very careful examination of the stud books. These, however, do not seem very common. They cannot be detected by ordinary means and the only protection which the buyer of the horse may have is the honesty of the breeder.

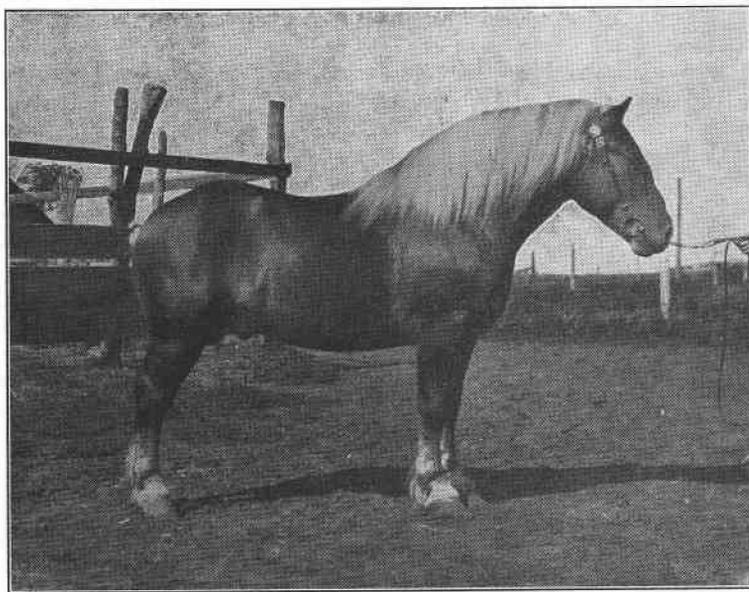
The examples of fraudulent pedigrees noted above are not theories of what might be done, but are samples of what has been done in Oregon. The Stallion Registration Board, in its brief existence, has come across examples of all these kinds of fraud. In many cases the unsuspecting owners had paid a good many hundred dollars for the horses bearing these fraudulent certificates.

### CARE AND MANAGEMENT OF STALLIONS.

The best system for management of the stallion is that given the gelding—three fairly heavy feeds a day and a good day's work six times a week, with a rest and light feed on Sunday. The feed should be about  $\frac{3}{4}$  of a pound of oats a day for each 100 pounds live weight, with the same weight of bright clean hay. The ideal hay is a mixture of timothy and clover. Oats and vetch or clean grain hay will do very well. A pure timothy or a pure leguminous hay is not as desirable as the mixture mentioned. The stallion should be broken as a two-year-old but not worked much then. The breaking of the stallion should be conducted the same as for the gelding, remembering, however, that the stallion is stronger, more spirited, and less likely to be frightened than the gelding.

During the breeding season most Oregon draft stallions are peddled; that is, taken around from farm to farm where the mares are to be bred. If the circuit is ten miles or thereabout, the horse will get plenty of exercise in this way. Some breeders lead their horses with a saddle pony,

while others drive them to a cart, or, in some instances, ride them. The saddle pony is more convenient, since this method saves much hitching and unhitching. Better control of the horse is also secured in this manner, but of course it means the maintenance of an extra horse. When the stallion is kept at home during the season, and the mares brought to him, the question of exercise is more serious. It will be necessary to give the horse at least a five-mile walk each day, either hitched to a cart or led with a saddle horse. This is a disagreeable job, but it must be done if the horse is to be a sure foal getter. If at any time he shows signs of



No. 3. The two-year-old in finished form ready for the market.

being slow in serving, or uncertain, give him still more exercise. Some horses have to be worked hard before they are good breeders. Do not use drugs, or dope of any sort; neither those advertised in the papers nor those recommended by your friends. Give the horse good feed, plenty of exercise, and keep him clean; then if he gets sick call a veterinarian. Do not try to treat a stallion yourself; he is too valuable an animal.

#### **Stables.**

The stall for the stallion should be box form, not less than 14 x 14 feet, absolutely solid in construction, with smooth walls, and no manger,—at least no manger of the ordinary type. A small feed box for grain may be put in one corner, but this had best be movable so that it may be taken out after feeding. Some make successful use of a slatted hay rack placed in one corner rather high from the floor, say about 4 feet. Others use a type of smooth manger across the corner of the stall, so as to have no

sharp edges. If a manger is built, it should have no openings, since the horse is likely to try to get over it and get hurt in the effort. Some men feed hay on the floor. At any rate, do not turn the stallion loose in a box stall with the common manger. The stall should not be away off from the other horses, but in the same barn; and the upper part of the walls, above 5 feet, should be open so that he can see around. Steel stall guards, such as are in use at the College barn, are very good for the top of the stalls, but woven-wire hog fencing is just as good, and cheaper. A horse in this sort of a place will be less restless than if confined in a solitary dungeon and less liable to contract the common stall vices, such as cribbing, weaving, masturbating. He will also be better behaved when he is brought out. To prevent him from rubbing his tail, have the walls of the box slope in at the bottom about one foot. A good way to accomplish this is to nail a 2 x 4 on the floor. This 2 x 4 should reach entirely around the stall and be about one foot from the sides. Then take boards 2 feet long and set them on end, the upper end against the wall, and the lower end against the 2 x 4. Nail firmly and you have a good wall. Wherever the stall is located there must be an exercising lot. This, which must be in connection with the stall, should be roomy,—the larger, in fact, the better, even if it assumes the dimensions of a pasture. It should comprise at least an acre of ground. To make a fence high and strong enough for a stallion costs a little more than ordinary fencing but it pays. One hundred dollars will fence quite a pasture, and in many cases will be repaid the first year in the larger number of colts obtained. Exercise, for the stallion, pays money returns more quickly than it will with any other animal. Many stallions are changed in a few days from non-breeders to good foal getters by giving plenty of exercise.

#### **Methods of Handling.**

Out of season there is just one method of handling the stallion that is both cheap and satisfactory, and that is to work him regularly. Put him in with some other good horse and make a regular team of the two. Work them and care for them just the same as any other work team; but do not turn the stallion out to pasture. With regular work, and a light feed on Sundays and other idle days, there need be little trouble. A stallion out of season can do just as much work as a gelding of equal size and conformation. Many stallions are easier to work in many ways, but they are more or less restless so that the driver must stay with them all the time.

As the breeding season approaches the treatment should remain the same. If the stallion is in a good, healthy condition for field work he is in the proper condition for breeding. Many people let their stallion run down in the winter and then make a great effort to get them in shape for spring. There should be no "getting in shape;" the horse should be in prime condition all the time.

#### **Equipment.**

Every man who handles a stallion should have the proper equipment for safe breeding. This should consist of a place for trying the mare, one for breeding, some type of restraining apparatus for the mare.

and a stallion bridle. Mares are very apt to kick when they are being tried or teased. The commonly-used teasing pole does not fully protect the stallion. A much safer arrangement is a solid wall three feet high and 10 to 12 feet long. This should be so strong that the mare cannot kick through it. Its top should be broad, rounded, and smooth. The posts at the ends should either extend several feet above the wall or stop on a level with it. If the post is just a little above the wall, an unruly stallion may become unmanageable and hurt himself by trying to jump and landing on the post. A good, strong pen in which to confine the foal should be near by, probably directly in front of the mare. Mares with foals are much quieter if the foal is in sight. In most cases if a mare is in season she will show signs with a few minutes' teasing.

The place for breeding should afford good footing for the stallion and mare. For this reason, a covered shed is usually better than an open yard.

Breeding hobbles should be used on every mare that is at all nervous or excitable. Even the gentlest of mares sometimes kick unexpectedly. If a stallion is good enough to be used as a sire he certainly deserves full protection. The hobbles should be strong enough to hold any mare. Weak hobbles are worse than none at all. The best type of hobbles consist of a strong neck band, or collar, and straps to pass around the hocks. Those that fasten around the pastern hold just as well, but the ropes are lower and the mare or stallion is more likely to become entangled in them. The hobbles should always be placed in position before the stallion is brought in sight, for nearly all mares are nervous when the stallion is near.

If the stallion has been properly handled and trained, a strong bridle, with a plain bar bit and a lead rein with a chain at one end, is sufficient for controlling him. The chain should be passed through the ring on the near side, under the chin, and then fastened in the ring on the off side. Tough-mouthed and headstrong horses sometimes require a more severe apparatus. The following apparatus is usually successful with horses of this type: An iron rod  $\frac{3}{8}$  inch in diameter and 8 inches long is fitted with rings at both ends. One end is fastened in the ring on the off side of the bit. The other end of the rod is passed under the chin and through the ring on the near side of the bit. The lead rein is fastened in the ring on the free end of the rod. A heavy snaffle bit should be used. The lead rein should never be passed over the head of the stallion.

### **Breeding.**

If a stallion is well developed and properly cared for, he may cover eight to ten mares in a season when he is two years old. At this age, a stallion should not be bred oftener than once in four or five days. A well-developed three-year-old stallion may cover twenty to thirty mares in a season without injury to himself. At this age the horses should not be bred oftener than three times a week. Forty to fifty mares may be bred to a four-year-old. One mare a day, or perhaps sometimes three in two days, is all he should cover. A mature stallion may make two covers a day. If bred oftener, the fluid frequently contains very few germ cells (spermatazoa).

### Use Pure Bred Stallions.

The stallions of Oregon, according to answers to a circular letter sent out by the Stallion Registration Board, average getting with foal 68 2-3 per cent of the mares to which they are bred, and on the average they are bred to 46 mares a year. It is also noticed that the pure-bred stallion heads the list with an average of 56 mares a year, while the grades and mongrels average only slightly over 40 mares a year. Through the same medium, it has been determined that the average fees for stallions in the State are as follows:

	Single Service	Season	Guarantee Foal
Pure Breds .....	\$ 11.00	\$ 13.00	\$ 16.00
Grades .....	7.00	10.00	13.00
Mongrels .....	8.00	10.00	12.00

Attention is especially called to the fact that pure-bred stallions are not standing at a very much higher fee than are the grades and mongrels, the average being about \$3.00 higher for the different methods of payment. This is not enough difference, and more could well be afforded in payment for the better classes of horses. One of the things that Oregon especially needs is more pure-bred horses, but more pure-bred horses will not come in unless the people recognize that they are worth more money and that an investment in a better service fee is a good investment. Statistics compiled at Wisconsin show that it is an investment of over 500 per cent in five years to pay the difference in the price of pure-bred stallions as compared to grade or mongrel stallions. In other words, a \$5 or \$6 additional price in service fees will mean from \$30 to \$50 or more difference in the price of the mature horse.

## THE FARM WORK HORSE.

### Grooming.

In this discussion of the farm work horse we will take up the subject in the order of the daily routine of the horse's life. The first thing to be done in the morning before breakfast is to groom the horse. Grooming answers several ends: It removes from the skin those particles of perspiration, dust, and dirt that would otherwise clog the free action of the sweat and oil glands. It removes the scurf and worn-out cells which are no longer required on the surface of the skin and which would, especially when cemented together by particles of sweat, add to the obstruction of the glands. In a state of nature the horse's skin is usually able to take care of itself, but it is not under conditions of high feeding and excessive perspiration in the presence of dust and dirt, conditions which nearly always prevail with work horses. Another, and the most generally recognized object of grooming, is to improve the horse's looks. This is especially true with driving horses, while with work horses there is usually little effort to do more than get off the external mud, sweat, and dirt, and to make the hair lie in the right direction.

The necessary instruments are a currycomb, a mane comb, and a fiber brush. By fiber brush we mean one made of a stiff vegetable fiber and

not of hair or bristle. The best currycomb is one made of three or four concentric circles of spring steel, with teeth on both sides. This kind is elastic, and may be used on the horse's legs and head without giving him pain. Besides it lasts quite as well and can be cleaned without having to knock it to pieces on the stall wall to get the dirt out. Some authors say that the currycomb should not be used, but it is essential for getting out mud and old sweat marks, and is good for the skin.

In currying, start with the head, carefully going over this part with the brush, using the comb only where necessary. Move the brush slowly around the head, or you will irritate the horse and make him cross about having his head curried. Then work back from the head, using the currycomb in the hand toward the horse's rear and the brush in the other. Go over the entire body in order,—neck, shoulder, fore legs, sides, hips, and hind legs. Where the hair lies straight and there is little mud, the comb need not be used on the legs; but instead a good vigorous brushing will do. After the body is curried, comb out the mane and tail with the mane comb, using the brush at the same time.

The mane and tail should not be allowed to get too heavy, but should be thinned out occasionally by combing with a knife. The foretop should be clipped short, back to about three inches behind the ears. The mane under the collar is sometimes clipped, but it is a question whether the short, stubby growth does not irritate the neck more than the long hair. If the fetlocks are long, they may be clipped. Ordinarily, it is best to clip the fetlocks only, and not try to clip clear around the pasterns.

The amount of currying necessary for the horse will depend upon how slick you want him, and whether or not he has spent the night in the pasture or in the stable. If he has been in the pasture, he will need a good deal of currying regardless of how he looks, in order to get his skin properly cleaned out. If a horse can get out and roll at night and have the loose dirt cleaned out the next morning, his skin will keep in pretty good shape.

### **Harnessing.**

Harnessing comes next. The all-important part of this job is to see that the collar fits right. It must be wide enough so that it will not pinch, but not so wide that it will work from side to side. It should be just long enough so that it will not choke the horse when pulling. When the horse is standing still, there should be plenty of room at the bottom to run the hand between the collar and the neck. The collar should be clean and smooth and the top pad must be hard and firm, not soft leather that gives way in creases that irritate the neck. If a pad is used it must be long enough to come within two or three inches of meeting at the bottom of the collar.

### **Sore Necks.**

Sore necks should be vigilantly watched. Sores on the points of the shoulders are caused by the collar being too wide. The remedy is to put on a narrower collar or to use a pad. The sore may be treated with gall cure. The various brands of proprietary gall cures sold by harness makers and druggists are all about alike, and fortunately all are good.

Their use is recommended. Small sore bumps, or dollar boils, may be found along the side of the shoulder. These may be caused by an ill-fitting collar, but are more often due to a derangement of the system which is very common in summer. See that the collar fits properly, and treat the bumps with gall cure. If the sore is large and persistent, use a pad, cutting out a hole just over the sore. Sores on the top of the neck may be caused by too wide a collar. A collar wide at the top works back and forth, thus irritating the top of the neck. These sores are also often caused by a side draft or by too much weight on the neck yoke. They may, however, be due to a derangement of the system. Prevention is the best cure, and prevention involves avoiding the causes above mentioned. If the horse is subject to such afflictions, always use a pad on him. Pads are generally condemned by the agricultural press, but they are very useful articles, nevertheless, especially in the prevention of sores on the top of the neck. If such sores appear, in spite of precautions, use a pad, treat with gall cure, and change the horse, if possible, so that he will have no weight on his neck. This treatment, if started in time, will prevent the sore from getting any worse until such time as the animal may be turned out for a rest. The treatment might cure him if started at the very beginning, but the outlook is not hopeful, as the majority of cases do not get well until the horse is given a rest.

Especial care must be taken when the horses are first put to work in the spring. The work must not be too severe and the collars must be fitted carefully every day, since the neck shrinks rapidly, due to the forming of muscles and the loss of fat. The mane should always be pulled out from under the collar before starting to work, and it is also well to inspect the collar and hames several times in a half day to see that they are right, and perhaps to lift up the collar and air off the neck. Washing the neck and shoulders at meal time with cold water is a splendid practice, and a handful of salt in the water makes it still better. Washing the neck is especially valuable for colts and for horses at the beginning of the season.

Fitting the hames is often neglected, but is of just as much importance as fitting the collar; in fact, it is a part of the latter operation. The rightness of the collar and its width at the top and bottom are largely regulated by the adjustment of the hames. The rest of the harness must fit the horse neatly so as to look well and be comfortable.

### **Watering.**

Horses should be given water three times a day, before feeding. The argument in favor of watering before meals is that the horse's stomach is small and if water is given after eating the feed is washed on into the intestines without having remained in the stomach long enough to have been properly digested. In actual practice the advantage is not large. It is very important, however, to water horses regularly, especially where they do not get water more than three times a day. They may be offered water at an unusual time and refuse, only to get very dry before the next opportunity to drink; but if they are watered at a regular

time they form the habit of drinking at that time and drink sufficiently. Care must be taken with farm horses to see that each one has a fair chance at the trough. Sometimes the meaner horses will fight away the timid ones; and the latter, as a consequence, will get thin, without the teamster knowing the cause. Some horses are naturally slow and hesitating about their drinking. Such horses must be encouraged to drink their fill. The water should be clean and pure—good enough for the owner to drink. Many claim that ice water is dangerous, but the point has not been proved. Salt should be before the animals at all times, but should not be mixed with the grain. The horse should be his own judge as to the amount he needs, unless he has been without for a long period, in which case he should be accustomed to it gradually.

### **Grain.**

The standard grain for the work horse is oats. From 4 to 5 pounds (4 to 5 quarts) three times a day is the usual feed. The oats do not need grinding. Barley is about the only other grain feed used in this State. It should be ground before it is fed, or better still, rolled. One-third, or less, barley in the ration does just about as well as all oats. More than that proportion may be fed, but it is not so good; for the barley produces more heat, and most horses do not eat it readily. Some horses will not eat it at all until starved to it, and then never in sufficient quantities to keep them in good condition. One pound of barley contains a little more nutriment than one pound of oats, but for the reasons mentioned is usually valued at about 10% less. Digestive disorders are also more common when barley is used. Wheat is more dangerous than barley and its use is not recommended. The use of stock foods and condition powders is not recommended.

### **Hay.**

It is not necessary to feed hay in the morning, although if there is some in the manger it will do no harm. At noon some hay should be fed and at night there should be all that the horse will clean up well. We believe that a hard-working horse will not clean up too much hay if given all that he wants along with the amount of grain mentioned. When the horse is standing idle in the stall, however, the amount should be limited, or he will nibble at the hay all day to the detriment of his digestion. One pound for each 100 pounds live weight will usually be sufficient in these cases. The best kind of hay is a mixture of clover and timothy, although almost any of the common hays are all right if clean and bright. Pure alfalfa or clover will go farther than most other hays, but may have a bad effect on the kidneys if fed year in and year out. In the eastern part of the State horses are often required to do a good deal of work on alfalfa or grain hay alone, and often with very satisfactory results. The animals should be given plenty of time to eat, and the work should not be too heavy or continued for too long a time without giving the horse a rest and change of diet.

### **Work in the Field.**

Work in the field varies so much that little can be said about it here. The draft should not be so heavy that it becomes necessary to rest the

horse, unless it be when he is young or soft. The greatest amount of work will be done where the horse can take a brisk gait and keep it up all day without undue fatigue, rather than by cutting a wider swath and having to moderate the gait, or even to rest part of the time. It has been proved by actual tests that a horse can do more at a speed of  $2\frac{1}{2}$  miles an hour than at a slower or faster gait. At a jog trot of 6 miles an hour he can do only 2-3 as much and at 10 miles an hour only 1-5 as much.

At night work horses should be given a liberal feed of hay and allowed to munch at it until nine o'clock, or bed time, when they should be turned out into a pasture adjoining the stables. This pasture should not be too large, and should be so arranged that the horses may, in the morning, be driven into the stable not without difficulty. For this purpose there should be a lot or corral in connection with the stable and a gate opening into the pasture. The pasture should be so located that this gate is in one corner, or what is still better, connected with one corner of the pasture by a small lane. This lane should not, however, be fenced with barbed wire. With such an arrangement the horses may be driven into the stable the first thing in the morning, with less trouble than it takes to clean out the stable where they are kept. Horses allowed to pasture at night may be a little sweatier than otherwise, but their digestive systems will keep in better shape and their legs and feet will last twice as long. On Sundays and holidays they may be left out all day without grain, although if they are working very hard one feed will do them good. Where no pasture is available, or where for any other reason it becomes imperative to keep the horses in, they will rest better if turned out into the stable lot at bed time and put back in the barn the first thing in the morning. Sundays, and other days when they are not working, the feed should be cut about one-third to avoid azoturia.

#### **Azoturia.**

Azoturia is a peculiar disease that affects horses when they are first taken out to work after a day or so of idleness on heavy feed. It is sometimes called "Monday-Morning sickness" because of its frequency on Monday morning after the rest of Sunday. The symptoms, according to "Diseases of Horses," U. S. Department of Agriculture, are as follows: In the milder form this affection may appear as a lameness in one limb, from indefinite cause, succeeding some sudden exertion and attended by a dusky brown color of the membranes of the eye and nose and some wincing when the last ribs are struck. The severe forms come on after one or two days of rest on full ration, when the animal has been taken out and driven one hundred paces or more. The fire and life with which he left the stable suddenly give place to dullness and oppression, as shown in heaving flanks, dilated nostrils, and pinched loin. The muscles of the haunch become swollen and rigid, the subject moves stiffly or unsteadily, crouches behind, the limbs being carried semi-flexed and he soon drops, being unable to support himself. When down, the body and limbs are moved convulsively, but there is not power or co-ordination of movement of the muscles. The pulse and breathing are accelerated, the eyes red with a tinge of brown, and the urine, if passed, is highly colored,

dark brown, red, or black, but it contains neither blood clots nor globules. The affliction may end fatally in a few hours or days, or recovery may ensue, which is usually more speedy and perfect if it sets in at an early stage. In the late and tardy recoveries partial paralysis of the hind limbs may last for months. A frequent sequel of these cases is an extensive wasting of the muscles leading from the front of the stifle upward and a complete inability to stand. The prevention of this serious affliction lies in restricting the diet and giving daily exercise when the horse is not at work. The disease is never seen at pasture, rarely under constant daily work, even though the feeding be high, and the attack is usually precipitated by taking the horse from the stable and subjecting it to exercise or work. The poisoning is not present when taken from the stable, and the horse is likely to be noticeably lively and spirited, but he usually succumbs within the first half mile of exercise.

A horse that has had one attack should never be left idle in the stall or barnyard for a single day. This disease is a serious problem in the cities, but need not be on the farm as it may always be prevented by leaving the horse in the pasture when he is not working.

#### **Treatment.**

The first symptoms noticed are sufficient for even the layman to detect. The horse should be stopped at once, and a competent veterinarian should be called to attend the case. Until he comes, the horse may be treated by putting cloths wrung out of hot water over the kidneys. If a veterinarian cannot be secured quickly, give a dose of bromide of potassium (4 drams) and sweet nitre (1 ounce). Drench slowly and carefully, giving the horse time to swallow. Do not move the horse, but leave him right where you see the first symptom. If none of these remedies is available, let the horse stand until he has recovered, which he may do in a short time if stopped at the start.

#### **FEEDING THE CITY WORK HORSE.**

For city horses we find that two kinds of feeds are used as the staple base for all feeding operations. These feeds are oats and timothy hay. The Armour Packing Company feed their horses five times daily, and if any horses are called out irregularly such horses are fed an hour before going out. Oats and timothy hay constitute the regular ration. A hot bran mash is given on Sunday mornings, and only one more feed is given that day. Nelson Morris feeds corn as one of his feed concentrates. His horses are fed when called out irregularly, and again at the regular feeding time, from a nose sack. Swift & Company feed oats largely as the main concentrate, and also give a hot bran mash once a week. Their horses are very good, and are noted as a strong advertisement for Swift & Company. Most of the large transfer firms in the city of Portland feed their horses chiefly on oats and timothy hay. The greater part of this hay is bought East of the Cascades, as the timothy from that region is much more uniform in its general make up than the hay produced in the Willamette Valley. Certain firms use some barley, and others use considerable bran. Most of the firms that have used barley

claim that it is somewhat more expensive in the long run than feeding oats and bran, and generally causes more or less digestive troubles with their animals. A great many feed oats as the main ration, and then on Saturday night give a hot bran mash, and but very little feed, except hay on Sunday. The reason for the small amount of hay on Sunday is that the horses may not be troubled with azoturia when taken out on Monday morning. Some of the larger firms are using a little mixed hay, but, as stated before, timothy forms the chief roughage for all city work horses.

### **The Driving horse.**

On the farm, the first and most serious problem in connection with the driving horse is—how much of the time he should be allowed to run in the pasture. Were he sure to be worked every day, we would say that he would need pasture only for a few hours once in a while for a change. On the other hand, if the softening and heating effects of pasture were no more manifest than with work horses, we would say turn him out whenever he is not in use. The driving horse on the farm is used with little regularity, and when not used, few farmers can find time to take him out merely for exercise. Thus in a busy season, the driving horse might stand idle for a week or more. The writer has found pasture, with certain modifications, the most satisfactory system of management. Ordinarily, the horse has the liberty of the pasture, and where it is known beforehand that he is to be used (and this is usually the case), he is put in the stable the evening before, or, where he is not to be used until evening, early that morning. Oats if given in four-quart amounts at the regular feeding periods is the proper ration under these conditions, but the hay should be limited. Leguminous hays should not be used, especially soft, washy, second cuttings; but rather some woody, carbonaceous hay, such as timothy, that has become quite ripe before cutting. Twelve hours, with nothing but oats and a little dry hay, will usually put a horse in good driving condition, although early in the spring, if he has been running on rank young pasture, twenty-four hours may be required. Late in the season when the grasses have become quite mature, and especially with bunch-grass pasture, the horse may be in fair driving condition directly from the grass.

While it is usually possible to give the horse a few hours in the barn before using, emergencies will arise when it is necessary to take the animal directly from the pasture to the harness. In this case the manner of driving will have a good deal to do with the results attained. From two to five miles at a walk will put most horses in condition for a thirty-mile drive, providing they are walked right from the start. But if they are started off at a fast gait and begin to scour, an all-day's work will not stop the trouble. The tendency to scours varies with different horses. Some will scour at the slightest provocation, while others will be constipated unless precautions are taken to prevent this condition. Late in the summer and during the fall the driving horse may run in the pasture and stubblefields and be in good driving condition with no tendency to scour. In this case, there is no question that he should have his liberty. Of course, it is possible to keep a horse in the barn all the time, and by careful management, plenty of grooming, and daily

work keep him in such condition as to look better and do more driving than the horse that has been in the pasture. The conditions mentioned, however, are impracticable on the farm, except in rare cases.

In the city, and other places where keeping horses up becomes for any reason imperative, a box stall must be provided, and in connection with this a lot for exercising. This exercising lot should be long and narrow, rather than square or circular in shape. In Western Oregon such a lot should be floored. Twenty-five dollars will floor a good-sized lot. The horse should have access to this lot all the time except when the weather is very severe. Even this lot is a poor substitute for exercise and the animal must be worked practically every day. If not turned out to pasture for a few weeks now and then, his legs and feet will go wrong.

### **Feed.**

Hay should be fed at the rate of 8 to 10 pounds a day. Clean, bright timothy is the best, although a little mixture of one of the legumes will do no harm. Where the work required is not very fast, the hay may be largely of a leguminous nature without injuring the horse, thus making it possible to lessen quite materially the amount of grain used. But where the very best results are expected, the timothy ration should be maintained, at no more than 10 pounds a day. Oats should be the grain fed, and they should be clean and heavy. When the horse is idle or nearly so, 5 to 8 pounds (quarts) a day will be enough, but when he is working hard more will be required—4 to 5 pounds at a feed. The condition of the horse must be noticed and the amount of feed regulated so that he will be maintained at the desired degree of flesh. When the horse is working hard always feed nearly double the amount given when he is idle.

### **Grooming.**

Grooming is of still more importance with driving horses than with working horses. The same objects are to be obtained, but the question of looks is of far more importance. When the horse comes in from the pasture, or after he has stood in the stable all night, he should first be given the same treatment as outlined for the work horse; but the job does not end here. In addition to the currycomb and fiber brush other instruments are needed. Perhaps the most important of these is a good, flannel cloth sufficiently large to make a good handful. A brush of bristle, or hair, is also needed. These brushes are more expensive than those of fiber, costing two or three dollars; but they last indefinitely. The fiber brush is good for cleaning the coat, while the bristle brush is a good polisher, but has little use in cleaning, except for getting out fine dust after the fiber brush has been used. After the horse has been groomed with the currycomb and fiber brush, use the flannel cloth and bristle brush until all of the dust is whipped out of the skin. Work the dirt out with the brush and wipe it off with the cloth. This part of the job will take from thirty minutes to one hour of hard work, according to the amount of dirt present and the thoroughness with which the job is done. Now take the bristle brush and the cloth and shine him thoroughly. The rubbing should be done with the brush, using the cloth mainly to wipe

off the dust, although it is useful for rubbing too. The final touches depend upon how well you have done the previous work. If the coat is perfectly clean so that the brush will work out no dirt, finish with it, otherwise use the cloth last. If the horse has been very dirty to start with, especially if the dirt is soil dust, it may not be possible to remove it completely by the means mentioned. In this case, put a little kerosene on the cloth, not enough to rub off on the horse, but just enough to gather the dust. This will leave the horse looking slick and fine. It should not be used, however, until the coat has been thoroughly cleaned with the brush and cloth. The grooms should always be sure to reach every part from the ears to the hoofs. To clean the hoofs, knock off the external dirt and rub them with a piece of gunny sack. The nostrils and eyelids may be cleaned with a damp rag.

The mane and tail should be combed out as indicated for the work horse. Then they should be brushed thoroughly, first with the fiber brush and then with the bristle.

Washing is of no value except to remove manure stains and mud. Even the washing of the horse's legs with the hose to remove the mud is a practice that may easily be abused. The water cleans the outside but does not reach under the hair, where dirt, sweat, and scurf will collect and cake, very much to the detriment of the legs. If the legs were curried thoroughly, this danger would be obviated, but the fact that water makes them look clean causes this job to be neglected in the majority of cases.

In no case, however, does water promote a shiny coat; on the contrary, it has a tendency to make it dull and staring; hence wherever finish is the main consideration, do not wash.

#### **Blankets.**

The use of a blanket in the stable is to be recommended at all times. In the summer the blanket should be very thin. A light burlap, little better than a fly net, is all right. In the winter a heavier one may be used, but not too heavy, since there is more danger of the animal catching cold when taken out if he is used to a heavy blanket in the stable. A storm blanket should be provided for the protection of the horse when obliged to stand out during bad weather. When the horse returns to the stable in a sweaty condition in cold weather, put on a light porous blanket and then on top of that a heavier one of some very absorbent material. The outside blanket will draw the moisture and leave the inner blanket and skin dry. When the skin becomes dry take off the outside blanket. If such blankets are not at hand put the horse in a protected part of the barn where there will be no drafts and let him stand uncovered until about dry and then put on the usual blanket. Most storm- and many stable-blankets are made of a sort of canvas or denim largely water- and wind-proof and lined with some softer material. This is the proper blanket to protect the animal from wind and storms and is all right for a dry horse in the stable, but if put on a wet horse it will hold the moisture and the animal will not dry out as he should, but will stay cold and wet. When the horse is in the stable and dry, we should not attempt to blanket him for warmth, but rather to keep the coat in good condition, short and glossy, and free from dirt.

## MULES AND JACKS.

A mule is a hybrid produced by crossing a mare with a jack. A hinney is a hybrid produced by crossing a stallion with a jennet. As is the case with other hybrids, they will not breed. The male animals are commonly spoken of as horse mules and the female animals as mare mules. Although the male animals cannot breed they need to be castrated in order to work satisfactorily. The mare mules meet with more favor upon the market and will usually command a price of from 5 to 10 per cent higher than the horse mule. The reason for this is commonly said to be due to the fact that they are more satisfactory to work, and not so stubborn as the horse mules.

The principal advantages of mules as compared with horses are as follows: (1) they are recognized to be somewhat more hardy than a horse; (2) they are recognized to be somewhat surer footed, and for this reason are more in demand as a pack animal; (3) they have a better sense of self-protection, and for this reason a good many people argue that they are better for use with unskilled labor; (4) they are somewhat easier to feed in large bunches, and hence on large plantations and ranches and large contractors jobs, they meet with greater favor; (5) they are commonly considered more tough and wiry than horses, and on this account will stand more hard work and more abuse than will horses.

On the other hand, there are some well-defined disadvantages in raising mules: (1) Perhaps the most important of these is the fact that they will not produce; in other words, they will never be able to raise any young, and so, in order to earn their way they must do so entirely by the work that they perform, rather than by raising colts, as is the case with mares; (2) another disadvantage with mules to people that especially like style and attractiveness, is the lack of spirit and style. They are not as handsome and attractive as a well-bred horse. A good many people will argue that for the amount of work done a mule will require less feed than a horse. This has been found by experiment to be largely a fallacy and that in common labor the horse will do about as much for each hundred pounds of weight as will a mule; while feed requirements for horses and mules for each hundred pounds live weight are practically equal.

The use of mules is growing in some sections of the United States. In every section we find a decided increase in the size of the mules used. This is being accomplished by the use of better bred jacks with more size of bone and the use of bigger mares for the production of mules. At the present time, as previously stated, most of the mules are used in the South. Throughout the North we find a good many large mules. In some sections of Oregon we find the use of mules increasing to a greater and greater extent. It is likely, moreover, that the production of mules will continue to increase in Oregon. This is especially true in the wheat belt. Many of the men in that section are buying mules to replace their horse teams.

The reason for this change is the fact that the mule works more satisfactorily in large teams than does the horse. When worked on the combine, for instance, they are less likely to hurt themselves than are the more spirited horses. On the other hand, we find a great many men who prefer horses on account of the fact that they have more spirit and are not as hard to drive and keep going as are the mules. Some men prefer horses, also, on account of the fact that they can breed their mares, thus keeping up their supply of horses, whereas the men with mules must depend on buying new ones, or raise them from some other source than mules themselves. That the mule is more easily handled in large numbers than the horse is also further shown in the methods that are used in feeding the mule when on large jobs. On such jobs the feed for the mules, mostly wheat and hay, is put in a large rack. Mules will not overeat, as will horses, and therefore will not cause as much loss in feed.

The management of mules is very similar to that of horses. They are somewhat easier to raise than the horse on account of the fact that they will take a little better care of themselves, and are not so likely to get cut up in wire fences and hurt as are horses. They will also bunch together in feeding to a little better advantage than will horses. The general food requirements for raising good mules are the same as for raising good horses. In order to develop them to the fullest extent, they must have plenty of feed during the early part of their lives. As previously stated, for each hundred pounds of live weight, there is but little difference in the relative economy of keeping horses and mules.

Most of the jacks of the State of Oregon are largely imported from other states. The raising of jacks and jennets is very similar to the raising of horses and mules. One thing should be noted with regard to the raising of jacks that are used in the production of mules; namely, they will not usually breed to mares if they are allowed to breed any jennets. Jacks that are used in the production of mules, therefore, should be limited to the breeding of mares. The production of hinnies by the use of stallions and jennets is as yet in its infancy, and is a much argued question as to whether or not it is a practical proposition. The stallion will not breed jennets unless he is raised with them entirely and kept entirely away from mares.

#### GLOSSARY OF HORSE AND MULE TERMS.

Burrow—A small species of ass generally used as a pack animal.

Blemish—A scar, scratch, etc., that is unsightly but does not injure the usefulness of the horse.

Bow-legged—Too wide apart at the knees, the opposite of knock-kneed.

Buck kneed—Knees bent forward when standing.

Calf kneed—Knees bent too far back, the opposite of buck kneed.

Capped hock—The point of the hock back of the web enlarged. Caused by a bruise of the bursa.

Cock ankle—Standing bent forward on the fetlocks, more often on the hind legs.

Colt—A term commonly used to signify young horses of either sex, although technically speaking it refers to the male, while the female is commonly spoken of as filly.

Coupling—The space or connection between the dorsal vertebrae and the pelvis on top of the back. This is best measured by the distance of last rib from hip.

Cow hocked—Standing with hocks together and hind toes out.

Crampy—Raising either one or both hind legs up with a jerk. More apparent when the animal has been standing and is cool.

Cribber—An animal having the vice of biting or setting the teeth against something and “sucking wind.”

Cross firing—Hitting one of the fore feet with the opposite hind foot when traveling.

Curb—An injury or sprain of the ligaments at the back of the hock which usually causes an enlargement.

Curby hock—The back of the hock is rounding when viewed from the side.

Docked—Having the end of the tail cut off.

Donkey—An ass or mule.

Ewe neck—A deficiency of muscling causing a depressor at the top of the neck just in front of the withers.

Filly—A female animal not yet of breeding age.

Filled-in hocks—May mean either bog spavins or thoropins, although most often the former.

Fistula—Fistulous withers. An abscess occurring in the region of the withers.

Foal—A young animal of either sex under one year of age.

Forging—Striking the front shoes with the toe of the hind ones.

Founder—Inflammation of the feet causing lameness. Technically known as laminitis.

Gelding—Male animal which has been castrated.

Heavey—Having the heaves.

Hipped—Having the point of one hip broken over so that it appears lower than when normal.

Hinney—A hybrid from stallion and jennet.

Horse—Used as either male or female, but technically as male.

Interfering—Striking the fetlock or cannon with the opposite foot as it passes, either in front or behind.

Jack—A bone spavin.

Jack—A male ass.

Jennet—A female ass.

Knee sprung—Over on the knees caused by the relaxation of the extensor muscles. Sometimes spoken of as buck knees.

Knock-kneed—The front legs bent in at the knees with feet wide apart. Sometimes called bench legged.

Mare—Female animal, although generally used after the animal is three years old or of breeding age. Previous to that time she is commonly known as a filly.

Moon blindness—Technically known as periodic ophthalmia. This is an

affliction of the eyes which causes a sort of a blue scum to cover over the pupil.

Mule—A hybrid from jack and mare.

Overreach—Reaching farther forward with the hind feet in traveling than where the front feet were picked up.

Paddle—Throwing the front feet in when traveling.

Parrot mouth—The upper teeth extending over the lower ones.

Pink eye—A disease causing a white scum to form over the eye, often causing blindness.

Poll evil—A fistulous condition or abscess on or near the poll.

Posting—Rising and falling in the saddles with each alternative step when the horse is trotting.

Puffs—Wind galls, bog spavins, or thoropins.

Quarter crack—A vertical crack on the side of the hoof, often running to the coronet.

Quittor—A fistulous gathering upon the heel or coronary band of the foot.

Ringbone—A bony growth on the upper or lower pastern bones, and almost always causing lameness

Roarer—Defective in wind.

Shoe boil—A bruise at elbow which results in an abscess.

Sickle hook—Too much bend in the hock. A conformation predisposed to curbs.

Side bone—An ossification of the lateral cartilage, occurring on either side of the foot.

Slab-sided—Flat ribbed.

Sound—A horse with no injuries in any way.

Splint—A bony growth on the cannon bone, occurring most often on the front legs and on the inside.

Stallion—A male animal, although commonly applied to a male colt only after he is of breeding age.

Stringy—Stringhalt. A convulsive action in the hind legs, flexing either one or both up with a jerk.

Stump sucker—A cribber.

Sweeney—Shoulder muscles shrunken away, causing a depression.

Thoropins—Puffiness occurring in the web of the hock.

Unsound—An animal that is injured for service, due to some fault.

Wall-eye—The iris a pearly white color, due to a lack of pigment. Sometimes called glass-eye.

Windgalls—Puffs occurring at the upper part of the fetlock joints.

Windy—One that whistles or roars when exerted.

Whistler—One defective in wind.

Winging—Throwing the front feet out when traveling.