LIVE STOCK MANAGEMENT

BEEF CATTLE

BY

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CORVALLIS OREGON
The Extension Service of the Oregon Agricultural College embraces all instructional work done by the College staff outside the institution. This includes institute, lecture, and fair work in all its varied phases, supervision of the county demonstration and farm work provided for by state legislation; correspondence courses; preparation of educative exhibits; publication of bulletins and distribution of news matter; cooperative work with granges, farmers' unions, schools, churches, commercial clubs, and other progressive organizations in the promotion of industrial and social enterprises. The Extension Service, in short, consists of carrying out to the people of Oregon practical and usable information on all subjects taught at the College.

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Particular attention is called to the fact that counties desiring to organize for agricultural field and demonstration work, under the provisions of Chapter 110, Laws of 1913, must make an initial appropriation in order to secure the State aid. Those interested in promoting this work should communicate with the Director of Extension, or the State Leader, at the Agricultural College, with reference to the best methods of procedure.

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GENERAL CONSIDERATIONS.

Numbers and Distribution. According to Farmers' Bulletin No. 575, there were in the United States on January 2 of the current year (1914), approximately 57,000,000 cattle of all kinds. Of this number 21,000,000 were classed as milk cattle, and their value estimated at $53.94 a head. The remaining 36,000,000 were classed as "other cattle," and their value estimated at $31.13 a head. In studying these figures, it must be remembered that those for milk cattle include only milk cows, and do not include calves and young stock of dairy blood, which should properly be classed along with dairy cattle. It will be noted that there are about as many milk cattle in our country as horses, and that there are nearly twice as many "other cattle." The number of milk cows in Oregon is estimated at 196,000 and of "other cattle," 470,000. Thus we see that the proportion of milk cattle in this State is rather below than above the average, in spite of the fact that Oregon is by many considered as a dairy state. The milk cows in Oregon are valued, according to the Department of Agriculture estimates, at $65.00 a head, and the "other cattle" at $38.00 a head. It will be noted that although the numbers of all kinds of cattle in Oregon are below the average of the United States, the estimated value a head is high.

Beef cattle are found in considerable numbers in every state of the Union, but are especially common in the Mississippi Valley and on the eastern slopes of the Rocky Mountains. The far western states, in spite of the fact that they are large range countries, are below the aver-
age in number of cattle. Washington, Idaho, Utah, and Nevada all have somewhat less cattle than Oregon, but California, Arizona, and the Rocky Mountain states each have distinctly more. The leading beef-cattle-producing states are, in order: Texas, Iowa, Nebraska, California, Missouri, Illinois, Minnesota, Wisconsin, Oklahoma, these being states which have over 1,000,000 cattle each. Texas has over 5,000,000. The leading dairy-cattle states are, in order: Wisconsin, New York, Iowa, Minnesota, Illinois, and Texas, these being states which have over 1,000,000 dairy cattle each.

The United States produces more cattle than any other single country. Our nearest competitors are Russia, Brazil, and Argentina.

In Oregon most of the dairy cattle are found in the western part of the state, particularly in the northern end of the Willamette Valley and in Coos and Tillamook counties. In Eastern Oregon dairying is confined largely to the irrigated lands and is not very extensive even there.

The beef cattle are found mostly in Eastern Oregon, especially in the central and southern portions, although there are a great many in the northwestern portions. West of the Cascade Mountains there are very few large herds, but a considerable number of smaller ones are scattered throughout the rougher districts, both in the Cascade and Coast Mountains. The live-stock industry of these mountain ranges of Western Oregon is largely cattle.

**Importations and Exportations.** There are several times as many cattle imported into the United States as there are horses, but even then the number and value is not great. The importation of pure-bred cattle for breeding purposes is not as extensive a business as the importation of pure-bred horses, although in some breeds the imported stock are an important factor. Table I will give an idea of the number of pure-bred cattle of the different breeds imported during the year 1912.

**Table I.—Importations of Pure-Bred Cattle in 1912.**

<table>
<thead>
<tr>
<th>Breed</th>
<th>Bulls</th>
<th>Cows</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alderney</td>
<td>3</td>
<td>46</td>
<td>49</td>
</tr>
<tr>
<td>Ayrshire</td>
<td>23</td>
<td>392</td>
<td>415</td>
</tr>
<tr>
<td>Dexter</td>
<td>6</td>
<td>54</td>
<td>60</td>
</tr>
<tr>
<td>Guernsey</td>
<td>32</td>
<td>561</td>
<td>593</td>
</tr>
<tr>
<td>Hereford</td>
<td>5</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Holstein-Friesian</td>
<td>3</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Jersey</td>
<td>37</td>
<td>424</td>
<td>461</td>
</tr>
<tr>
<td>Shorthorn</td>
<td>25</td>
<td>70</td>
<td>95</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>134</td>
<td>1,554</td>
<td>1,688</td>
</tr>
</tbody>
</table>

It will be noted from Table I that the number of females imported is greatly in excess of the number of males, and that the larger portion of all animals are of the dairy breeds. Of the beef breeds we find only 30 bulls and 70 cows. In comparison with the importation of pure-bred cattle, we note that there were imported during the same year 1957 stallions and 1910 mares.

By far the larger portion of cattle imported are not pure-bred animals, but are beef and stock cattle imported from Canada and Mexico. The importation of beef stock cattle from these countries is a com-
paratively recent thing, since it was only a few years ago that the United States was an exporting instead of an importing country. Furthermore, until a few months ago there was a tariff of about 27½% per cent ad valorem on all beef cattle imported into the United States. The removal of this tariff has greatly increased the interest in the importation of beef animals. Eastern Canada has been shipping some cattle into the northern markets, especially to Buffalo. The number of cattle so imported, however, has not been sufficiently great to influence the price. Occasional shipments are also made from British Columbia into the Puget Sound district. Various rumors have been current to the effect that the importations would materially influence the prices, but according to the best information which this department is able to obtain, these importations have so far been of no importance. The importation of cattle from Mexico has not been materially changed by the removal of the tariff, on account of the revolution now going on in that country. There is no doubt, however, that whenever peace is established, there will be a very considerable importation of cattle from that district. Particularly will this apply to young stock such as calves and yearlings. Mexico has immense areas especially adapted to the raising of calves, but they have only limited areas at all suitable to the finishing of good steers. On this account there are a good many cattle men in the southwest who claim that whenever conditions are normal they will quit raising calves, and instead, will buy young stock from Mexico and mature them on their own ranges.

The importation of dressed beef from foreign countries such as Australia and Argentina, is being tried in an experimental way; but up to date no extensive trade has developed. The fact is that these countries have a market for all the cattle they can raise at prices just as good as they could obtain by shipping them to the United States; so that it will require a material increase in the present beef prices in order to bring in any considerable amount from those countries.

The importation of various animal products is of much more importance than the importation of the live animals. There are over a hundred million dollars worth of these products imported annually, of which the larger portion are hides and skins, about half of these being from cattle. It is a common impression that the various packing-house by-products can be marketed only through the ingenuity of the big American packers, but the fact is that the American demand for those products is even greater than the demand for meat.

**Beef Sections of Oregon.** The state of Oregon has an extremely wide range of climatic and agricultural conditions. In Western Oregon, that is, the part of the State west of the Cascades, the climate is quite mild, rainy in winter, and somewhat dry in summer. The valleys, particularly the Willamette Valley, are devoted to general agriculture. The chief live-stock industry in these valleys is dairying, with sheep and hogs secondary. Practically no beef is raised on these farms, since there is very little pasture that yields well enough for beef cattle, and furthermore, the rain and mud in winter make it necessary to put both feed and cattle under shelter. In the Coast Mountains, however, and in the foothills of the Cascades, there is a considerable number of
beef cattle. This country is quite rough, with much timber. It would be quite suitable for sheep except for the prevalence of coyotes and other wild animals. The typical beef man of that region will own a few hundred acres of land, a small portion of which will be devoted to hay, together with some garden and fruit. His cattle will run on the open range during nearly the entire year, receiving a little hay
only during the hardest parts of the winter. They also receive very little care or attention during any part of the year. Little attempt is made to fatten them; if they get fat on grass, well and good; if not, they are sold and slaughtered without being fat. The business is conducted for the most part on a comparatively small scale. There are few men who own as many as a thousand cattle. The profits of the industry are hard to estimate. With their garden, fruit, and a few milk cows, these stockmen are able to make an easy living. The sale of a few cattle gives them some ready money and they live easily, with very little work, although few of them accumulate any large amount of money. The typical Western cowboy is not found in this region.

GRAZING MAP OF EASTERN OREGON.

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When we get east of the Cascade Mountains, we are in an entirely different country. It is a country of higher altitude, very little rain, dry summers, and cold, snowy winters. For the most part, it is a wild, rough country. Although only in small areas, there are a few types of land which are found repeated throughout this portion of the State, and in fact throughout the entire Northwest, from Kansas to the Cascade Mountains.
1. Irrigated valleys, small in extent but very productive, and devoted mainly to hay and grain, with some fruit in the lower elevations. The chief crop is alfalfa.

2. Rolling hills where the soil is fairly good, formerly used for sheep and cattle ranges but now devoted almost exclusively to wheat. This kind of country is found mostly in a strip running from 50 to 75 miles south of the Columbia River. Very few cattle are raised in this wheat belt.

3. Rough, ragged hills, covered with rock, sagebrush, juniper, and a little grass. The grass on these hills is very scarce, yet it forms the basis of a large portion of the cattle industry of Oregon. These hills become very dry in the summer and therefore not suited for summer sheep range, although they may be used for sheep range in the winter.

4. Higher mountain ranges, very rough and broken by rocks and forests, and yet affording a considerable amount of grass. These mountain ranges are nearly all in the forest reserve. They make ideal summer range for both cattle and sheep.

5. There is yet another region, peculiar to this State, known as the “lake” region, and found mainly in the south central part of the State. Much of this region has no drainage and there are numerous flat places which are lakes or marshes in winter, meadows in spring, and deserts in summer. This region produces enormous quantities of wild hay which is used almost entirely for wintering cattle grazed on the surrounding hills.

Three Classes of Beef Producers. There are about three classes of men interested in cattle raising in Eastern Oregon: first, and most important, is the man who makes an exclusive business of running cattle on the range; second, the man who does general farming in the irrigated valleys and raises cattle as a “side issue;” third, the man who makes a business of fattening steers on hay in the winter time. In addition to being a feeder, the latter may also be either a farmer or a stockman, most commonly a farmer.

THE RANGE CATTLE INDUSTRY.

The range-cattle man does his business on a different basis in different parts of the state, but generally speaking his equipment and operation will be about as follows: He will own a considerable tract of land, usually scattered over a very large area, so as to cover most of the available water and all the land in the little valleys suitable for hay raising. If he has land sufficient to raise a good deal of hay and controls a number of streams and springs, he can in this way control the use of a large area of outside range for which he has no legal title. Most of the land in the unsettled districts of Oregon is, or has been, government land, although there are considerable areas of road land which have never been put on the market until very recently. In addition to “controlling” a good deal of government land, the cattle man may run some of his stock on the forest reserves in the summer. In the case of much of the open range, no one stockman has complete control; but instead, cattle belonging to a number of people will be
found running together. This is true of the larger part of the Government land.

The amount of Government land in this State is usually very much under-estimated by those who have not taken the pains to look up the statistics. The following data give an idea of the area of the different kinds of land in this State:

Public Lands in forest reserves ........... 17,000,000 acres
Government land in forest reserves ........ 14,000,000 acres
Unimproved deeded lands, timbered ........ 13,000,000 acres
Unimproved deeded lands, not timbered .... 6,000,000 acres
Cultivated lands in farms .................. 4,000,000 acres
Uncultivated lands in farms ............... 4,000,000 acres

It will be seen from the foregoing figures that approximately half of the land in Oregon is Government land, practically all of which is available and now used as range for beef cattle, sheep, and horses. Most of this land lies east of the Cascade Mountains. The unimproved deeded land is very largely timbered, belonging to lumber companies and located for the most part in Western Oregon. The Government
forest reserves are all timbered to a greater or lesser extent, but at the same time afford some grazing on practically every township. On the other hand, the timbered areas of Western Oregon usually afford very little grazing. About 6 or 7 million acres of this unimproved deeded land, however, is not timbered, and is all used as range for live stock. Some of it is under fence, some leased to stockmen, and some grazed by the stock of the general public, as is the case with the Government lands. Of this non-timbered area, a considerable portion lies in Eastern Oregon and consists of what is commonly called "Road land." This is land that has been granted by the Government to various companies for the construction of wagon roads. The uncultivated lands in farms are not used for strictly range purposes, but are practically all used for fenced pastures for some kind of live stock. There is therefore somewhat less than seven per cent of the total area of the State actually under cultivation. About 20 per cent or a little more is too heavily timbered for either farming or grazing. The remainder, amounting to nearly three-fourths of the entire state, is devoted to grazing. It will thus be seen that the raising of live stock on uncultivated land is an extensive industry in this State, in spite of the common report that all of the range land has been taken up and put under cultivation.

The system of management is comparatively simple. During the summer season the cattle run exclusively on the range, mainly in the higher and more inaccessible districts. They are given little care except occasionally to see that they do not stray too far away, and to give them salt. One man will look after several hundred cattle. No attempt whatever is made in the way of herding. In some cases there is a little attempt at line riding; that is, guarding a certain line to prevent the cattle from going into some district where they are not wanted, or perhaps to keep them from straying into the forest reserve when no permission has been granted. In the fall of the year the cattle are rounded up, when those that are to be sold are separated and sent to market. Sometimes the cattle are rounded up in a certain district two or three times during the fall; in other cases, there will only be one round up at this season. It is usually necessary for several men to get together in order to collect their cattle. When the round up is over, those which are not to be sold or taken into some other country are turned loose again. When winter comes, they are worked down onto the lower lands where there will perhaps be some grass saved up for winter range. On the Government land it is practically impossible to save any grass for winter use, but a little may be saved on the land which belongs to the stock man. This grass which has grown up in the summer and died down in the fall makes a splendid feed where abundant, and when the snow is not too deep makes a good and economical method of wintering cattle. The inability of cattle men to control the range, however, usually makes it difficult to save any considerable amount of grass for winter use, and thus the stock man is obliged to feed a large amount of hay, even when there is little snow on the ground. The feeding of hay is put off until as late in the winter as possible, since the cattle will not rustle for grass to any advantage after they have once had a taste of hay. The amount of hay used, in
any case, is comparatively small. One ton a head would be considered quite liberal. Most of the hay used is wild, although there is some alfalfa. When spring comes the calves are branded and the cattle worked out to the distant ranges. The steers are ordinarily kept until they are three years old, although some stockmen who have sufficient hay to fatten them in the winter will sell them off as “twos.” The range men, however, do not undertake a great amount of winter fattening.

The weight of cattle marketed depends a great deal upon whether they are marketed for feeders or for beef. The cattle marketed in the fall for winter-feeding purposes range in weight from 950 to 1150 lbs., with much the larger number coming between 1000 and 1100. The cattle that are fat enough for beef usually weigh between 1100 and 1300, with the larger portion between 1100 and 1200. The ages at which cattle become fat enough for beef and reach a weight of 1100 to 1200 will depend upon the system of feeding. Where range is especially good and where it is supplemented in the late summer and fall by pasturing the meadows, we find that such weight may be attained at a comparatively early age: and it is common in the better range districts to find two-year-olds in the fall (actually about two-and-a-half years old), that will weigh more than 1100 and are fat enough for beef. This must be understood as the exception, and most of the cattle do not attain a marketable weight and finish until they are three to three-and-one-half years old, and in some cases practically four.

The reader will bear in mind that in designating the age, cattle are called two-year-olds until they are practically three, and in the case of early calves they may be three past. For example, in the late winter calves may be fully three years old and still be called two-year-olds. A few months later, however, they will be called “threes.” The same applies with the three-year-olds, and when we speak of cattle being marketed at practically four years old, you will bear in mind that such cattle are still designated as three-year-olds. In the big cattle districts of Central and Southern Central Oregon there is not enough hay and meadow land to finish off the cattle at the early ages, so nearly all of the cattle go for beef at three years old, whereas in the northwestern part of the state, particularly in the valleys of the Powder River, Grand Ronde, and Wallowa, we find a considerable number of cattle ready for market at an earlier age, and it is in this part of the country that we find the big, well-finished two-year-olds.

In some of the range districts, particularly those most distant from the railroad, it has been quite common in the past to market the cattle as “stockers,” either at one or two years of age. These cattle are taken out to other ranges and there matured. This is because many of the big stock ranches are located at 100 to 150 miles from railroads. The “stockers” may be driven this long distance without any particular damage, but fat cattle cannot be driven so far. Cattle that were ready to market when they left home would lose considerably in weight and deteriorate in condition after a hundred-mile drive, and would probably not be suitable for beef purposes at that time. Espe-
cially is this true when feed and water are scarce along most of the route, which is the case nowadays practically everywhere.

As for the breeds used, Hereford and Shorthorn are the most common, and practically all of the cattle on the Eastern Oregon ranges carry a large percentage of the blood of one or both breeds. The range cattle of Oregon are as a whole very well bred, and there is but little evidence of inferior blood. In the last few years, since cattle have been sufficiently high priced to justify the expense, many of the range men have been using very high-class, pure-bred bulls, and even those that are using grade bulls are buying only animals so well bred up as to be practically pure bred.

The business is mainly in the hands of comparatively small outfits; that is, ranches capable of running a few hundred cattle, although there are still a few very large outfits, running several thousand cattle. The capital invested will ordinarily run from $10,000 to $50,000.

The profits of the business are very hard to estimate. Most of the ranch men have been in the business for a good many years and have accumulated considerable property, both in cattle and land. The land was in most cases obtained for little or nothing and the cattle were raised at little expense. The business was accomplished by much risk and considerable hardship, but on the whole those who have followed it for a number of years have been quite successful. At the present time, however, these men value their real estate rather high, and this, combined with the large amount of hay required in the winter time, makes the margin of profit rather small. Very few of these men are now making more than a very moderate rate of interest on the value which they give their holdings. The situation is also complicated by

Fig. 5. Spring and Fall Range on the John Day River—Wheeler County.
the rapid deterioration of the range. Much land which formerly pro-
duced a good deal of grass now produces practically nothing, and in
many places sagebrush and weeds have almost completely taken the
place of grass. This is making the cost of wintering higher and higher,
and also tending to deteriorate the quality of beef. Nevertheless, the
man who has a fairly good range and plenty of land for raising hay,
is making very good money. His great drawback is his inability to
obtain legal title to the range which he uses. If there was some sys-
tem whereby he might homestead or purchase this land, he would then
cut down the amount of stock and give the land a chance to develop
instead of killing it out by overstocking. Under the present conditions,
however, there is no incentive for the stockman to protect his range,
since the grass which he might save for his own use would be eaten
up by some one else's cattle or sheep.

The reason that the present cattle range is devoted to the cattle
business rather than to some other form of agriculture, is because the
land is too rough to be used for anything but cattle, sheep, or horses.
The competition of the small farm has largely done away with the
range-horse men. Between cattle and sheep, however, the range is
still equally divided. The chief reason for raising cattle in preference
to sheep is the absence of high mountain pastures where the grass will
be green throughout the summer. This green grass is necessary for
the ewes and their lambs, but the cattle can get along very well in
the drier sections. The high mountains of the forest reserves are
especially suitable to sheep, and would be almost exclusively devoted
to that industry were it not for the policy of the forest officials who
prefer cattle to sheep, on account of the less damage done to young
trees. The forest supervisor usually refuses to allow cattle men to
run sheep in place of cattle, but will most likely grant permission to
change from sheep to cattle. These are the most important factors,
although in some cases the large amount of work and worry connected
with the sheep business leads the stockman to take up cattle instead.

THE FARMER BREEDER.

Many of the more well-to-do and ambitious grain and hay farm-
ers in the irrigated valleys raise a few cattle in connection with their
farming operations. The cattle will be run on the ranges or bunch-
grass pastures during the summer. Very few are pastured in mid-
summer on the irrigated lands. In late summer or fall they are brought
in from the ranges and allowed to clean up the stubble fields, which in
this semi-arid climate have quite a feeding value. They are also
allowed to clean up the meadows. In many of the hay districts we find
that the third or fourth crop of alfalfa or second crop of clover and
timothy, may make a satisfactory pasture, even though not quite good
enough to cut for hay. During the winter the cattle are still allowed
the run of the fields, and in addition have access to the straw stacks.
In some cases they get no feed other than the straw, but on the great
majority of ranches some hay is given during the winter, particularly
during the later part of the winter and early spring. As soon as the
grass is good on the hills, the cattle are again turned out on the ranges
and the farmer pays little attention to them during the summer, devoting almost his entire time to his farming operations. In some cases the farmer may own his own range and have it fenced. In other cases he may lease range, and in still others, several farmer breeders may go together and hire some one to look after the cattle out on the open range or Forest Reserve. While there are very few large herds handled in this manner, there are many small ones, so that the total number of cattle raised by these breeders is quite considerable. The quality of cattle raised in this way is also above the average, and many of the best steers produced in Oregon are raised by this class of stockmen.

The profits made in this business are comparatively large, since the cattle utilize the stubble fields, straw stacks, and other material which would otherwise be wasted. Of course, the number which can be kept on any farm is rather limited, the usual number being from twenty-five to two hundred. These farmers raise cattle rather than sheep mainly because of the less care and work required. Since cattle are handled almost entirely as a side issue, the owners do not care to devote much labor or expense to the industry. If the sheep were raised, it would be necessary to have a herder throughout the year, and this in turn would necessitate a flock of perhaps 2000 head, a larger number than most of the small farmers could accommodate. Another factor is that the cattle seem to make considerably better use of the straw stacks than do sheep.

GENERAL MANAGEMENT.

Since beef are usually run on pasture or on the range until ready to go into the feed lot, thus receiving very little hay and no grain, the problems of beef raising resolve themselves very largely into problems of care and management. It is commonly said that beef cattle are not "fed," meaning, of course, that hay or grain is not given, but the animals instead are allowed to depend entirely upon pasture or range for their living. The popular press criticises the cattle men for these practices, and are fond of telling how much better cattle could be produced by the proper use of more hay and grain. This is all true, but the problem of producing better cattle is secondary to the problem of producing them cheaper so as to leave a greater profit for the man who raises them. With dairy cattle and hogs, the best feeding is nearly always the cheapest. The feeder who gets the best results with these animals finds that economy quite largely takes care of itself. With beef cattle, however, the case is entirely different. They consume more feed for what they produce than any other kind of farm live stock, and the only reason that beef is not very much more expensive than other kinds of meat is the fact that cattle consume feeds which might otherwise be wasted and require the minimum amount of labor and attention. A beef steer requires as much food as a dairy cow and yields about one-third the income. To put him in the stable and feed him in the same manner as a dairy cow would be an economic impossibility, although the finest kind of beef might be produced in this way.

Bulls. Like nearly all male animals, bulls will last longer, get a
larger percentage of calves, and handle a larger number of cows where they are not allowed to run with the cows at will, but are kept up and the cows brought to them when they come in heat. In spite of these facts, however, where beef is raised on a large scale it seems absolutely necessary that the bulls be allowed to run with the cows. The bad results arising from this practice can be largely overcome by allowing fewer cows to each bull and using only mature or fairly mature bulls.

In many places there is such an indiscriminate mixing of the herds that the owners do not know whether their calves are from their own bulls or from their neighbor's bull, or even from some maverick that has escaped castration. Under these conditions there is little incentive toward the use of good sires, so the first thing for the range man to do is to see that his cattle are so managed that his cows, and his cows only, are served with his bull. This may be accomplished in three ways: cooperation, line riding, and fencing, or perhaps by all of these together. Since the range man seldom owns all of the land upon which he runs his cattle, fencing can not be generally practiced, and even where he does own his range, the land may be so poor that the task of fencing enough off to make grazing possible for his herd would be expensive. The range countries are usually divided into sections of various size by streams, mountains, and other topographical features, so that cattle in one section will not stray into another. In other cases these divisions are not complete but are nearly so; hence a little herding at the mouth of the gulch or a few rods of fencing may complete the division. The natural divisions vary in size from small valleys capable of supporting a few milk cows to vast prairies comprising many counties. If the ranchman has control of one of these natural divisions of about the right size for his herd, be it large or small, he is indeed fortunate; but this happy state of affairs seldom exists, and as a result several men are obliged to run their cattle together unless separated by fencing or line riding. By line riding we mean keeping the herd in their power territory by having riders guard the imaginary line between ranges. Each man is given so much of the line to ride over each day. Along well-defined trails it may be necessary to have a man for only a mile or two, while in other places where the cattle are not inclined to stray one man may be given all that he can ride over two or three times a week. The natural divisions of the ranges are always taken advantage of, so it seldom is necessary to ride more than a fraction of the boundaries of the range. Line riding is expensive, but many cattle men find that the advantage of having their stock to themselves more than pays for it.

Where all of the men running cattle in the same territory are progressive and on peaceable terms, they may combine and agree to use only bulls of a certain grade. This plan, however, is seldom as successful as where each man has his cattle to himself, but is much better than running the cattle together without any cooperation. It also tends to lessen that other great evil of the open range—the practice of some men to run too many cows in proportion to their number of bulls, and depending on the service of their neighbors' bulls. It
is usually the man with a small herd that is guilty of this trick, since he has less at stake and can almost force the large cattle man to furnish bulls.

There is no bull too good to use on scrub cows, and there is no danger of paying too much for a bull, so long as you are paying for real beef-producing merit and not for popular blood lines on fancy points which have no value beyond the limits of the pure-bred trade, but which are often the basis of the extraordinary prices that are sometimes paid. The fact is that the poorer the cows the more the benefits that will derived from the better bull. Money invested in a better bull will do more to improve the herd than the same money invested in better cows. Figuring one bull to fifty cows, $100 added to the price of a common bull will do a great deal more toward improving the calf crop than $2 a head more added to the value of common cows. There will be a marked difference between the progeny of a $150 bull and of a $50 bull, while the calves from $52 cows will be but a very slight improvement over those from $50 cows. From the calf standpoint, the money invested in the bull goes about 50 times farther than when invested in the cows.

If often happens that fine beef bulls are off type in some fancy point of the breed, or are of an unpopular family. Such bulls may be purchased cheaply, and should be watched for by the man who is breeding grades for the beef market. Then again, good bulls of mature age are often sold because their calves are coming into breeding age; these, too, may be bought cheaply and are often more useful than a young bull would be. This refers only to bulls from the small farms with registered herds. Discarded range bulls should not be purchased for breeding purposes, as they are too often sold because they have lost their breeding powers through too much service or general hard conditions.

Good bulls may be purchased from almost any of the breeders of good pure-bred Shorthorns and Herefords in Western or Eastern Oregon, and are marketed through the public auction sales held at Portland two or three times a year. Many of the range men get their best Shorthorn bulls at these sales. The Hereford breeders are largely located east of the mountains, and on that account sell their bulls direct to the range men without auctioning them off at public sales. In fact, there are practically no public sales of Hereford cattle held in this State, or in adjoining states.

Under farm conditions a yearling bull should sire about 15 calves; a two-year-old, 30; and a three-year-old, 60. Under range conditions this can not be expected. A mature bull on the range will not get more than 40 calves and as a rule about 25 or 30. A yearling should not be used on the range, since hard conditions and too many cows not only cause him to get very few calves that year but usually render him useless thereafter. Use a mature bull and put one with each 20 or 30 cows.

The price commonly paid for beef bulls ranges from $75 up to $200. It is practically impossible to buy a bull of any kind whatever for less than $100, and the better grades cost from $150 to $200. This
is for good, well-bred, registered animals. A fancy grade of bulls, such as are suitable to head good, pure-bred herds can not be bought for these prices, but will cost $400, $500, and on up to $2,000 each. A few years ago there was much complaint that the range men were trying to buy their bulls too cheaply. Cattle were low and feed expensive, and the range men felt that they could not pay $150 or $200 for a bull when cattle were at the prices which they were then receiving. In the meantime the breeder of pure bred was not getting for his stuff what it cost to raise them. Within the last year or two, since beef cattle have been a good price, we hear less complaint from that source, and the range men are commonly willing to pay very good prices for bulls good enough to justify the breeder in trying to produce them.

There still remains in many districts of Oregon, however, the undesirable practice of crossing breeds. There are only two breeds in common use, the Hereford and Shorthorns; but as a rule there are crossed and recrossed indiscriminately, and in many cases where breeders have been using pure-bred bulls for many years they still have no uniformity in their herd or no established kind of breed. It is an established fact that cattle well bred along the line of one breed have more uniformity and are more salable than cattle of mixed breeding.

Cows. The well-known veterinary authority, Fleming, estimates that the average breeding efficiency of cattle is about 78%. By this we mean that with 100 cows of breeding age we should expect 78 calves per annum. The carefully managed farm herd on the one hand, will do somewhat better than this, and will sometimes go as high as 85% or 90%, but on the other hand, the average range herd will not do so well—the average being about 50%—although with good care and good bulls an average of 65% to 70% is obtainable. The improvement of this factor is a very important matter, and largely determines the cost of the calf. At the present time a good beef calf is worth about $25. If we assume the cost of caring for a cow a year is $15, it will be noted that if it is necessary to maintain two cows to get one calf there will be an annual loss of $5 on each calf, but if we can get four calves from five cows a nice marginal profit will be allowed. There is perhaps no other phase of the beef-cattle industry wherein so much improvement can be effected by good management, with the minimum investment in the way of capital. At first great care should be taken that there are never too many cows to one bull, and that the bull is strong, vigorous, and fertile. The other important factor is the elimination of the non-breeding, or shy-breeding, cows. In the market herd there is but one thing to do with a cow that comes from the range in the fall without a calf; namely, to send her to the butcher. Usually if she brings no calf she will be fat, and if she is not she should be given a few weeks in the feed lot.

Along about January you can often tell what cows are not going to bring calves in the spring, and it is not then too late to put them in the feed lot and turn them for beef at a profit rather than to carry them another year as "deadheads." Such a practice will have a great influence upon the herd in making the cows regular breeders. When a shy breeder does have a calf, that calf will not be nearly so valuable
to keep in the herd because of the tendency toward irregular breeding that is likely to be transmitted. It is generally admitted by those who have studied the matter, that the two most common faults among all of our stock, and at the same time the two most damaging, are lack of constitution and low fertility. Not absolute barrenness, but breeding part of the time, is the dangerous thing. The former ends itself, but the latter is self-perpetuating.

The time of the year when calves should come varies with the feed and the climate, but it should be as early in the spring as the cow can take care of the calf. Where hay is abundant the calf may come some little time before grass is good. The additional growth of the calf will pay for the extra care, since he gets so much more good out of succulent summer grass and goes into winter quarters strong and vigorous. Late July and August calves are to be avoided. If weaned with the rest they are too young and will not do well, while if allowed to run with the cow on winter feed neither the cow nor the calf do well unless more hay is fed than the calf is worth. An August calf will not usually be any larger at two years of age than one dropped the following February. Late summer and fall calves are all right in the dairy herd or the show herd, but for market beef they are expensive and unsatisfactory.

The length of the period of pregnancy (the time between breeding and calving) is nine months; hence for spring calves the cow should be bred in early summer. The cow comes in heat at intervals of 18 to 21 days throughout the year and remains in heat for about 12 hours. Where the bull is not allowed to remain with the cows, care must be taken to watch the cows carefully every day when it is desired to breed them, else the period of heat will pass by without being noticed and thus cause three weeks unnecessary delay in the time of breeding and calving. Heifers should be bred to calve at about 3 years of age, unless they are especially well fed. They come in heat first at 10 to 15 months of age, and if allowed to run with the bull will calve at about 24 months, which is considerably too early, especially in a commercial herd. Heifers should therefore be kept in a separate herd from the age of 9 to 10 months until about 24 or 26 months of age.

Weaning. Spring calves should be weaned some time the next fall. There need be no hurry so long as the grass is good; in fact, in most cases it is best not to wean until the feed in the pasture begins to get scarce. Weaning should not, however, be deferred until after the cows are on winter feed. A pasture at some distance from where the cows are kept is a splendid place to wean calves, but the fences must be practically hog tight, not only where the calves are kept but also where the cows are kept. Such pastures are seldom found on ranches where cattle is the leading industry and where few or no sheep or hogs are raised. A common but good method is to shut the calves up in a tight corral and feed them all the hay they want practically all winter. Such a corral should be on rather dry ground, and provided with good watering facilities and a dry, well-bedded shed besides the necessary racks. Refuse or damaged hay may be fed, but it usually pays to
feed rather heavily of good clover or alfalfa all winter. Timothy is expensive and poor feed for calves or any other kind of cattle. Wild hays are not as good as the legumes, but some of them are very nutritious. Slough grass and tules are poor feed. The calves, when thus isolated in a corral, will be weaned before the winter is over, but should be left right in the feed lot until the grass comes. If the number is large enough to divide, the heifers and steers may be separated, and the steer calves fed the larger and better rations. There is little danger that steer calves will not pay for all of the hay they will eat the first winter, but heifers must be handled with more economy.

**Wintering Stock Cattle.** Winter feeds in different communities vary so widely that few rules for wintering can govern all cases. Dry pastures, stubble fields, straw, and hay are the foods used, the hay being reserved until the severer and later part of the winter. When hay feeding is begun it must last until grass comes again, since cattle that have had a taste of hay will stand around and bawl for more even though their regular feed be all right. For this reason it is often wise to let the herd suffer a little during the early storms rather than to begin on hay and have to keep it up until spring, although there may be plenty of other feed as soon as the storm is over. The amount of hay that can be profitably fed to wintering cattle depends on whether they are steers, heifers, or cows. Steer calves, as already mentioned, will pay for all the hay they will eat, providing it is not too high in price, say $4.50 or $5.00. Yearling steers will not pay for as much feed as calves, but for more than heifers, and heifers for more than cows. We usually expect cows and heifers to lose some flesh during the winter. It is not always profitable to try to keep them in the same flesh they were in the fall, provided they are fat at that time. If they come off grass in a thin condition, it will be necessary to feed rather heavily to keep them up. It is essential, therefore, that cows should go into the winter in good shape, since winter feed is very expensive as compared with summer grass. One ton of hay for a cow during the winter as a supplement to old grass and straw will ordinarily be enough; and a country where it is necessary to feed more than this is badly handicapped for beef raising. Heifers perhaps stand a little more feeding than the cows, but not much. They must be kept in a good, thrifty condition and that is about all. They will not grow very much during the winter, but will make a good gain during the summer. Yearling steers, as compared to heifers, should have a little more care, but it will not often pay to give them a full hay ration all winter. Even on light feed every pound of gain put on in winter will cost more than it will sell for, but stock cattle are usually worth more a pound in the spring than in the fall, because they have been carried over this expensive period and are now ready to make cheap gains on grass. Thus it is seldom advisable to attempt to make large gains in beef cattle during this expensive period, unless early finish is desired rather than economical growth. Moreover, steers that are fed heavily during the winter will not make as good gains on grass during the summer as those that have been fed more lightly and
are consequently thinner, but of course the gains for the year are not so different.

Two-year-old steers should not be wintered but should be put in the feed lot and finished for market. Practically all of our cattle country has reached a stage where it does not pay to keep three-year-olds. For the man who buys to feed, they are preferable to the younger stuff, but there is nothing in it for the man who raises them. Furthermore, the judicious but not excessive use of hay during the winter, especially for calves, will easily enable the ranchman to produce “twos” that will go into the feed lot in the fall weighing around 1,000, which is about as large as the common run of “threes.”

As a guide to the amount of feed required for wintering cattle, it may be stated that a 1000-pound steer or cow will require 16 or 17 pounds of good hay each day for maintenance. This means merely to maintain the weight without either gain or loss. The estimate is based on the use of hay alone, without the addition of any other feed, such as straw, stubble fields, or grass. On this basis one ton of hay would maintain the animal for just about 120 days, or four months. Where there is other feed to supplement the hay, or where it is not necessary to feed as long as 120 days, somewhat less than one ton of hay may be used. On the other hand if it is necessary to maintain the cattle on hay alone for longer than four months, or where it is desired to make some gain in weight, more than this amount of feed will be needed.

**FATTENING STEERS.**

When we speak of “fattening steers” we refer to finishing steers on heavy feed after they have grown to a fair degree of maturity on
range or pasture. When a steer gets to weigh about 1000 or 1100 pounds he is sufficiently developed so that there will be little profit in attempting to grow him to a much greater size. The older a steer gets, the slower the growth, and the larger the amount of feed consumed. Consequently, the cost of each pound of growth increases very rapidly, and at about the weights given (1000 or 1100 lbs.) it ceases to be profitable to develop them any farther. A good many cattle coming in from the range at 1000 or 1100 pounds, however, are not sufficiently fat to sell for beef at satisfactory prices. Hence they require to be put on full feed and fattened off as rapidly as possible.

Where steers become fat on the range and are sold directly to the butcher or packer we seldom speak of a separate process of fattening, but where these range steers are taken onto the farms, put into smaller feed lots, and kept on full feed, we speak of “fattening” them. In some localities, the business is carried on primarily with the idea of fattening cattle which would otherwise be in unsalable condition. More commonly, however, the business is conducted with the idea of marketing the feeds to a better advantage than by selling them direct to the dealers.

Fattening on Corn. In the Central States the fattening of steers is done almost entirely on corn supplemented with a little hay. The corn is fed in various forms, but most commonly on the ear. This is cheaper than most methods and also produces good gains. The amount of corn fed each day will vary from 15 to 35 pounds, the smaller amount applying to shelled corn. It is generally estimated by farmers, however, that a good, healthy steer will consume one-half bushel each day. It takes a large steer, however, to consume this amount, and the average is distinctly less. (One bushel of shelled corn weighs 56 pounds, while one bushel of ear corn is ordinarily estimated to weigh 70 pounds. A bushel of ear corn is the amount of ear corn which would produce one bushel of shelled corn. A 70-pound “bushel” of ear corn, would, therefore, much more than fill a basket.) Only a very small amount of roughage is used with so much corn; not over 7 or 8 pounds for each head after the animal gets on full feed. Most of the feeders in those districts pay little attention to the kind of roughage, but it has been conclusively proved that the use of leguminous hay, such as clover or alfalfa, will make the steers gain faster at much less cost. The steers will not only eat more hay, but will at the same time eat as much or more grain. In all cases it is the intention to give the steers all they will eat of both hay and grain, except for the first few weeks. Steers not used to heavy feeding can be allowed only a small amount of grain or they will gorge themselves and go “off feed.” This makes it necessary to begin with a small amount, 3 or 4 pounds daily, and gradually increase until they are eating all they will clean up twice a day. This increase is usually at the rate of about one-half pound a day, although some feeders increase the rations one pound a day for a few days, and then do not increase them at all for a few days more. It thus takes from a month to six weeks to get the animal on “full feed.” This process of “getting on feed” applies only to grain. Steers may be given all the hay
they will eat from the start, even if turned in the feed lot very hungry.

The steers fed in the Central States are largely "twos" and "threes," the average weight being around 1350 at market time. The length of the feeding period will be five or six months, and the gains each day under favorable conditions are two pounds or more in winter and about two and one-half pounds in the summer on grain and grass. The gains made in summer are cheaper than those made in winter and many feeders are now feeding in the summer instead of the winter as they formerly did. Investigations by the Missouri Station showed that over half of the feeders in that and adjoining states have discarded winter feeding.

As an adjunct to beef raising, in almost all of the eastern states, hogs are allowed to run with the steers and clean up the droppings. A considerable portion of the corn passes through the steers undigested and is utilized by the hogs following. Where ear corn is fed, the hogs will get from 10% to 20% of the grain fed, not counting the cob. With ground grain they get less. Sometimes the hogs get no other food, but when a large number of hogs are used some extra grain must be fed. The droppings are more completely utilized by stock hogs that are not getting quite all the grain they will eat. With whole corn, one to three hogs may follow each steer, while with ground corn one hog will clean up after two or three steers, or even more, in which case they will not repay more than four or five per cent of the cost of the feed.

The system of feeding above outlined is practiced throughout the corn-producing states, and thousands of cattle are fattened in this manner every winter. In the states following this method of cattle feeding the experiment stations have done a great amount of valuable experimental work along the line of fattening steers, and have published many good bulletins. Nearly all of the books as well as bulletins on cattle feeding have likewise been published in the corn belt. Consequently 95% of the literature on cattle feeding refers to a system of feeding practically the same as that outlined above. On this account we have described this system somewhat in detail, although it must be distinctly understood that cattle fattening in Oregon and in the other Northwestern states is carried on in an entirely different manner.

Fattening on Hay Alone. In the West, then, steer feeding is a different proposition. There is no corn, and the grains that are at hand are so high priced that their use leaves little profit to the feeder, especially when he is so far from the eastern markets that he does not get as high a price for his cattle as his eastern competitor.

Feeding with grain while the steers are on rich pasture during the summer is also impossible in this region, partly because of the high price of grain, partly because of the absence of rich blue-grass pasture, and more especially because the gains made on the range during the summer time are so much cheaper than can possibly be produced on any tillable farm. On the other hand, however, the western feeder in most localities has the advantage of plenty of alfalfa or clover hay at low prices and of a quality far superior to any hay with which the
Eastern feeder is familiar. The abundance and cheapness of this hay, then, makes it possible for the western cattle man to fatten steers in the winter as cheaply as can be done anywhere. In the corn belt the problem is to get the best possible use of the corn, while in the western states the problem is to get the best possible use of the hay. These conditions which we speak of as "western," however, apply only to those parts of Oregon east of the Cascade Mountains.

Western cattle feeding has developed only in recent years. It could not exist until the great hay fields had been developed, and, furthermore, with corn selling in the corn belt at 15 to 30 cents a bushel, as it was for many years, the western man could not meet the competition even with alfalfa at $4.00 a ton. But with corn at fifty cents and western hay at $4.50 to $6.00 in the stack, the advantage is the other way, at least for the cheaper grade of steers. Fancy beef is expensive to produce in the west because grain must be used.

Steers fed on hay alone consume from 35 to 45 pounds (providing the hay is good) daily, and make a gain of one to two pounds daily. The feeding period is not as long as in the East, usually three to five months. Counting hay at $6.00 a ton, this makes the cost of one pound of gain from six to twelve cents, and for a good profit requires a margin of about $1 for 120 days feed. By margin we mean the difference between the buying and selling price for each 100 pounds. During the past winters many steers have been bought for $4.50 a hundred pounds and sold after an increase of 200 pounds for $5.50 for each hundred pounds. Assuming the cost of the gain to be eight cents a pound, the profit must be in the increased value for each pound of the whole carcass. The fattening process makes the carcass better and hence more valuable, leaving out the gain in weight. Under the conditions named, if the steer weighed 1000 pounds at the start, the original cost at $4.50 would be $45.00. The 200 pounds of gain would cost eight cents a pound, bringing the total cost of the steer up to $61.00. He now weighs 1200 and if sold at the original price would bring $54.00, making a loss of $7.00. But because of the better beef he will make, he sells for $6.50 a cwt., thus bringing $66.00, and a profit of $5.00. The margin required to make a profit varies with a number of factors. High cost of feed, of course, increases the margin required. Small steers also require slightly more margin than large ones.

When steers are low in price, more margin is required than when they are high, providing the price of feed remains the same. For example, if the cost of a pound of gain was eight cents and the selling price of the steer was eight and one-half cents, a very fair profit could be made without any margin whatever. At the present moment cattle are considerably higher than the prices listed above, and consequently the margin of price between thin steers and fat steers is considerably less than $1.00 a hundred pounds.

The margin required, however, and the margin the feeder may get, are not necessarily the same. Anything which makes the steers fatter increases the margin. Mere increase in weight does not increase the margin. The increase must be in fat so as to make the beef better.
There is therefore usually more margin in older steers than in younger ones, because more of the increase in weight goes to fat and less to growth. Rapid fattening will also bring a greater margin than slow fattening. A two-year-old steer which is made to gain 200 pounds in 200 days might not be any fatter than when he began and so would sell at the same price a pound. A similar steer which is made to gain 200 pounds in 100 days would necessarily put much of that increase into fat rather than into growth and as a result would be fatter and sell for a higher price a pound. The chief factor affecting the margin obtained, is the condition of the cattle market. If the price of cattle goes up during the fattening period, the margin will be large; if the price goes down during the fattening period, the margin will be small, or may be wiped out entirely. This factor unfortunately is entirely beyond the control of the feeder and he must take his chances. If the price of cattle remains unchanged, however, a good steer weighing from 1000 to 1200 pounds at the start may be fed from 100 to 120 days on first-class hay and be made to gain around 175 pounds, at the end of which time he will sell on an average market for about $1 a hundred pounds more than at the start. In other words, 175 pounds of fat put on a good steer will, on a steady market, make him worth about $1 more for each hundred pounds. The feeder therefore gets his profit from two sources; one is this increase in the value of the original carcass; and the other is the increase in weight.

To the beginner the fluctuations of the market seem all important, but the old timer does not bother so much about them. He figures that what he loses from a drop in prices one time will be regained by a raise some other time. The averages are what count.

Feeding steers are usually bought locally, since, in the West, there are no large, open markets for feeding stuff such as are found in the East. The western feeder must buy from the range or wherever he can, and must be something of a judge of steers in order to make a successful purchase. His judgment is all the more important where he has to buy by the head; for in this case he not only has to estimate their value by the pound, but also has to guess their weight, and as may be readily seen, it is only too easy to miss the true value of a steer by several dollars. Experienced feeders study their animals very carefully and often become very expert in judging their weights and values. It is necessary that the feeder follow the market reports very carefully, so as to know the exact condition of the market. By frequent shipments to the large centers, he becomes familiar with conditions there. By seeing cattle sold, moreover, and then comparing his observations with the market reports for that day, he is able in the future to interpret the latter with far greater accuracy than he could otherwise. This ability to estimate quickly and accurately the value of a steer, is just as necessary as the ability to feed properly, and unfortunately requires more training than it is possible to get in school. The beginner should ask the advice of some older man, and should start with a small number of cattle, say a carload. There is a good deal of risk in cattle feeding, especially if it is done almost entirely on borrowed money. One hundred steers is not an enormous number to feed, yet
they will cost at least $5000, a larger sum than most farmers have to
invest for a few weeks. Besides, it is cheaper to borrow than to keep
the money lying idle for eight or nine months of the year. A reliable
farmer who has the feed, or the money to buy it, will have no trouble
in borrowing money at the bank with which to buy the cattle.

The kind of steers to feed will practically always depend upon
the price paid for them. There is no steer, and no cow or bull, that
is too poor to feed with profit if bought at a low enough price. Under
western conditions, however, as they usually exist, the medium to the
fairly good animal will return the greatest profit, since such an animal
can be bought at a reasonable price and can be finished to make a nice
carcass. The western market so far does not demand the highest
quality, so that it is seldom advisable for the stockman to look for the
fancy grades of feeders. On the other hand, the inferior light stuff
is also dangerous, although it may occasionally return exceedingly
large profits. But while the feeder who buys his steers may make a
profit on the poorer grades, this does not imply that the man who raises
them has made anything. It costs about the same to produce the poor
as the good, and the cattle raiser can not afford to grow anything but
the best. This is well illustrated in the case of the big four-year-old
steers that are occasionally offered for sale. These steers usually make
splendid feeders, since they fatten rapidly and sell well when fat, but
it is safe to say that the man who raised them lost money.

In the purchase of feeding steers it should be remembered that
fat steers are always worth more than thin ones of otherwise equal
quality. Thin animals make very good gains, but must be purchased
at a very low price on account of the fact that it takes a long time to

Fig. 7. Racks for Feeding Hay to Cattle.

finish them for market. It seems very difficult for beginners in the
cattle-feeding business to realize this fact, and it usually takes them
two or three years before they get to the point where they are willing
to pay for fat cattle the price that these are really worth.

Method of Feeding. When hay alone is fed, the method is very
simple. Large racks are built, usually on the following plan: Set
two rows of posts six feet high and six feet apart, the length of the
rows depending upon how long you want the rack. Board up on the
outside of these posts to a height of 2 or 2½ feet, and then above the
boards place a pole so the cattle pushing into the racks will not break down the boards. Along the tops of the posts place another pole. Some consider the rack complete at this stage, while others nail uprights from the top pole to the siding so as to prevent the hay from being thrown out. These uprights should be about two feet apart so that the steers can easily put their heads in between the poles. About three feet of rack space will be needed for each steer. Less than this amount may do where the steers are all dehorned, while a little more may be required if the steers are not dehorned. Be sure that the rack is of sufficient size, so that all the steers can eat at one time.

Another form of rack that has given good satisfaction is the old V-shaped rack made of upright poles about seven feet long and seven or eight inches apart so the animal may put only the nose through. On the outside a manger must be built about two feet wide and two and one-half feet deep. This form may be built like the first rack mentioned, leaving off the upright poles. Then run two poles lengthwise through the center of the rack about two feet apart and two feet from the ground and place the uprights inside of these, leaning outward and resting on the poles on the top of the posts. This will make the V part of the rack six feet wide at the top and coming together at the ground. The uprights must, of course, be nailed solidly in place. For feeding grain, tables, or "bunks," as they are called, should be made. These are simply heavy tables of two-inch material about 3 feet high and 3 feet feet wide. Make the length according to the lumber—12 or 14 feet. Sides, 4 or 5 inches high, are then put on clear around. As in the racks, about 3 feet of space for each steer will be needed; that is, 3 feet along one side or at the end. It is often advisable to feed more lightly of the grain at the beginning and increase the amount toward the close of the period. Many find it quite profitable to feed no grain until about the last month, and then to use a little in order to give the steers a better finish and make stamina for shipping. The writer, however, is a firm believer in the practice of feeding hay alone, making no attempt to use grain at all. The price of grain in the West is too high to enable the feeder to make a profit by its use. If the hay is of the better quality, a good gain may be made, and, while not as large as on grain, at a cheaper cost. But the hay must be good. Poor or damaged hay is not, under ordinary circumstances, worth feeding for fattening purposes. It will produce nothing more than a fair growth, and the steers will be worth no more a pound when through than at the beginning. It is argued that the time to feed the grain is when the hay is poor; and it is true that good results may thus be obtained, but the growth all comes out of the grain, and this brings the cost up to such a point as to be prohibitive. When hay is poor, no attempt should be made toward fattening steers, but such hay should be utilized rather for weaning calves and wintering stock. Probably less than 10% of the feeders in Oregon use any grain.

The Amount of Feed. The amount of feed will be limited by nothing less than all that the steers possibly can be persuaded to eat. Eleven-hundred-pound steers will actually eat, with real good hay and
careful attention, about 35 pounds a day. In rare cases they may eat as much as 40 pounds, but this is very unusual. More commonly they eat 30 pounds or less, but a steer eating only 30 pounds of hay a day will not get fat, and will be fed at a loss. On account of the fact that steers will not eat the stems and coarser portions of the hay to good advantage, it is necessary to allow them to waste part of it, and in order to get a steer actually to eat 35 pounds of hay a day it will be necessary to offer considerably more than this; as much as 40 or even 50 pounds a day. The stems and refuse hay should be cleaned out every day, and should be given to stock cattle and horses. Horses will clean up the coarse hay that cattle will hardly touch. The amount of hay refused and cleaned out will of course depend upon the quality of hay, but will ordinarily be from 5 to 15 pounds a day. Hay should be given at least three or four times a day. Where only a carload of cattle is being fed and all of the day’s ration may be hauled at one load, sufficient hay may be put in the racks in the morning to last the cattle all day, but several times a day it will be necessary to stir up the hay in the racks, and push it around where the cattle can get at it better. Loosening up the hay in the racks in this manner is about the same as offering new hay, and every time a steer is fed or offered fresh feed he will eat a little bit more. Hence the oftener he is fed the better. We cannot possibly expect to get steers fat on hay by filling up the racks in the morning and then not going near them until the next day. Even feeding twice a day will not give satisfactory results as compared with feeding three or four times. Where large numbers of cattle are fed, the feed is hauled continually throughout the day and in that way the cattle are generally fed four to five or six times a day. One man and a team can feed in this way from 80 to 100 cattle. The tops and bottoms of the stacks, if at all bad, should never be put into the racks, but, rather, scattered on the ground or fed to stock animals. If scattered out on the ground and fed to steers, they will waste all the bad portions of the hay; but it is much more economical to let fattening steers waste bad hay than to get hungry enough to eat it. Whenever the ground is dry or frozen it is a very good practice to feed about one load a day on the ground the first thing in the morning. Cattle would rather eat hay off the ground than from the racks, and if fed one load in this way the first thing in the morning they will clean it up with very little waste. Experiments have shown that a lot of a hundred steers will eat about as much out of the racks during the day with this extra load on the ground as they will without it. Hay that has any bad places in it should always be fed in this way. Where the cattle are allowed to run in a field of a considerable size it is possible to scatter the manure over the field in this manner, but of course when the ground is muddy all the hay must be fed in racks. Chopped hay or alfalfa meal must be fed several times a day, just as the long hay, but ordinarily the cattle will clean it up quite well and there will be very little waste.

The Length of the Feeding Period. The length of the feeding period will not be as great as in the East where, as we have noted, it is usually about six months. The average feeding period here will be
from 3 to 4 months and in rare instances 5 months. After this time the gains are slower and consequently more expensive. A higher finish is obtained, but it does not usually bring enough more money to pay for the cost. It is the consensus of opinion among practicalfeeders that it does not pay to feed longer than four months, unless unusual conditions prevail. Four months is the most convenient time to feed on most ranches. The feeding, on the one hand, can not well commence before time to bring the cattle in from the ranges and, on the other hand, they should be out of the way in time to get ready for the spring work; and four or five months will usually about fit these extremes. The market and the amount of hay on hand influence the exact time of selling. If one starts with the intention of feeding three months he may see that there is a chance for a better price earlier, or perhaps he may not want to sell until after his hay is all gone, so as to avoid carrying feed over until the next season. The hay market is usually very erratic late in the season.

Marketing. A fat steer full of feed and water will ordinarily weigh about 4% more than if he has been without feed and water for 12 hours. On account of this variation in weight where cattle are sold open, some allowance is always made for their 4% fill. This allowance is usually spoken of as "shrinking." Where steers are sold locally they are usually shrunk by standing 12 hours without feed and water or by weighing full and deducting 4 per cent. There is not much difference between the two ways of shrinking, although if there are any differences at all, the 12-hour shrink is the smaller. When shipped to some of the leading markets cattle are not shrunk, and in fact get all the feed and water they want before being sold.

In shipping, from 20 to 30 steers are placed in the car, the average being 25. There should be room enough so that if one lies down he can get up again. Eastern railroads charge for 24,000 pounds in a car whether you have that much or not, and this means 20 1200-pound steers, which will about fill an ordinary car. Oregon freight rates, however, are quoted at so much for each 36 1/2-foot car, regardless of the number in the car. In this case the shipper, to save expense, loads heavier than he otherwise would. If possible, get a car with good racks and fill the racks well with hay; and also be sure the cars are well sanded. The watering troughs found on most cars are out of order and utterly useless.

According to the ruling of the Secretary of Agriculture, cattle cannot be kept on the train longer than 28 hours without unloading and feeding, except upon written request, when they may remain 36 hours. The feeding en route is done at regular feeding stations which cater to this trade and which supply the necessary feed and water at a stated price, which is usually rather high. Practically all railroad points in Oregon are near enough to Portland so that it is unnecessary to stop and feed. About the only exception are points on the Prairie City line and on the Oregon Short Line beyond Huntington. Baker and Huntington are the feed stations for these points. There are feed yards at each Railroad Division point. After arriving in the yards, the stock is turned over to the commission man and there is nothing more
for the feeder to do except watch the proceedings and learn what he can about the market.

In the state of Oregon the beef cattle are practically all handled either by the local butchers or through the Union Stock Yards at Portland. About the only exceptions are those cattle bought by Seattle and Tacoma packing houses, and shipped directly to those places. The Portland Stock Yards handle close to 90,000 head of cattle a year. Of this amount Oregon furnished about one-half, Montana about one-seventh, and California about one-tenth. The remainder comes from various parts of the West. Just what proportion of the cattle sold in Oregon go directly to Seattle cannot be stated, but the number is not large. Only few cattle have gone to eastern markets during recent years.

The Oregon Packing houses now buy nearly all their cattle through the Portland Stock Yards. The Seattle and Tacoma packers, however, send out regular buyers into the various feeding sections and buy directly from the farmers. With the development of the stock-yards industry there has grown up a class of men known as "shippers," who make it a business to buy cattle from the farmer and ranchman, usually at so much a head without weighing, and then ship them to Portland where they are sold in the open market. These men are usually able to buy this stock from the farmers sufficiently cheap to enable them to make a profit. The chief reason for their existence is the fact that many of the farmers and ranchmen are afraid to ship to the open markets and take chances on what they can get. The shippers, however, understanding conditions better and knowing about what the stock will bring, are thus able to make a profit.

The only logical method for marketing cattle for the beef producers of Oregon is to ship their own cattle direct to the Portland Stock Yards instead of selling them to a shipper. The cattle are worth just what they will bring in Portland, and selling them to a shipper is merely gambling on the market, and gambling with men who know a good deal more about it than the producers. Shippers will claim that on account of their experience and knowledge of conditions of the Stock Yards they can get more for their cattle when they ship them there than can the producer, but such statements are without any foundation whatever in fact. The shipper taking his first and only carload to the Portland Stock Yards gets just as good a price as the old professional shippers who every day are shipping in carload after carload. The expenses of making such shipments may be listed as follows: Freight from point of origin to Portland; commission amounting to $15 a car; feed, including the small amount of feed which cattle will eat after arriving at the yard just before being sold; and yardage at 25c a head. In comparing prices received at Portland with prices offered or received at home, the shrinkage must be considered. This usually ranges somewhere between 20 and 60 or 70 pounds a head. All expenses considered, cattle shipped from most of the beef-producing sections along in Eastern Oregon to Portland should be worth at home within about 50c to 75c a hundred of what they would bring in Portland. That is, the expenses of freight, commission, yardage,
feel, and the shrinkage would make the cattle net on the home weight about 50c to 75c a hundred less than the price in Portland.

**Comparison of Feeds.** Alfalfa hay forms the basis of practically all of the steer feeding that is carried on in the West. By the term West, we mean to include the region west of the corn belt, or, in other words, west of central Kansas and Nebraska. In a few localities, clover or wild hays are used in place of alfalfa, but there are many times the cattle fattened on alfalfa that are fattened on all of the other hays together. The chief reason for this is the fact that the alfalfa meadows yield more and last longer than clover meadows. Clover is grown only in the sections where grain is the chief crop, the clover being used as a rotation crop with grain. Wild hays are generally grown where the supply of irrigating water is insufficient to justify the sowing of alfalfa. Because of the fact that alfalfa is grown under irrigation and cured practically without rain, it possesses a very high feeding value, but not higher than that of clover raised under the same conditions; in fact, if there is any difference the clover is the better, especially when fed without grain, as is the general custom throughout the West. The almost universal preference for alfalfa, therefore, is based upon economy rather than on superior feeding value. Chopped alfalfa is now being extensively used throughout the State. Chopped alfalfa is alfalfa hay cut into lengths of about one-half to three-fourths inch by running through a large cutter such as illustrated in Figure 8. The alfalfa is stacked in the field in the usual manner, and after it has stood for a few weeks so as to sweat out thoroughly, the cutter is drawn up beside the stack and the hay chopped, and then restacked right in the field. The chopped hay stacks as well as the long hay, and seems to turn water as well. In the winter the chopped hay is fed in the same manner as long hay. It is hauled in tight racks and handled with large silage, or coal forks. Alfalfa meal is similar to chopped alfalfa, except that the hay is ground up very fine. The meal has no apparent advantage over the chopped hay; and since grinding is quite expensive, the meal is not widely used. The advantages of the meal or chopped hay are ease of handling and saving of waste. One man can feed more cattle on chopped hay than on long hay, and the cattle eat it all up clean without waste. There is apparently no increase in digestibility or nutritive value resulting from the chopping or grinding. Since the usual cost of chopping is about $1.50 a ton, when hay is worth $6, the saving must be around 20% in order to show a profit. In some districts, notably the Big Hole country in southwestern Montana, the native meadows are irrigated, and are sown broadcast with some cultivated grass seed, such as rye grass, in addition. These hays, after being carefully cured, have a very high feeding value; in fact, the finest hay-fed cattle are produced in this region. Something like twenty-five thousand head are fattened in this way annually. In general, upland wild hay has a high feeding value, but that from the lowlands, especially where the
land is swampy, will not be sufficiently palatable and nutritious to justify its use for fattening purposes. As a general proposition, the species of plants from which the hay is made has less influence on the feeding value than the conditions under which the hay is cured.

![Modern Alfalfa Cutter](image)

The hay, to be suitable for steer fattening, must, without exception, be bright and green, and cured practically without rain. Hay which is brown or damaged for any reason, can seldom be used to advantage for this purpose, but had better be used for wintering stock cattle.

Timothy hay is very poor feed for fattening cattle. The price which it brings as a feed for horses, moreover, does not make it economical for cattle fattening, even though it had a high feeding value.

Vetch hay, if cured properly, would be satisfactory for this purpose, but practically all the vetch is grown in Western Oregon, where conditions for curing are for the most part quite unsatisfactory. Thus far, it has not proved possible to produce hay in Western Oregon of good quality and in sufficient quantity to be satisfactory for steer feeding. The demand for such hay for dairy and other purposes, moreover, makes the price prohibitive to the steer feeder. It is argued by some that steers could be fattened on vetch hay, kale, and barley. This could be done, without doubt, but the cost under present conditions would prohibit it. At present prices, the gain which could be put on by such feeding would cost about fifteen cents a pound, where ten cents a pound is about the maximum cost which the industry will bear.

Of the grains which may be used as a supplement to the hay, either barley, wheat, or oats will be satisfactory. These three grains have about the same feeding value, pound for pound, but a mixture of the three has proved superior to either one alone. It seems to be fairly well proved that it does not pay to feed grain at all, but where grain is used ten pounds a day is the maximum, and five pounds a day is best. These grains do not seem to have quite the same feeding value as corn, but they have never been thoroughly compared under similar conditions, and, at any rate, the difference is slight.

Rye is used in a few localities and has a feeding value somewhat similar to that of wheat, although hardly as good and not as palatable.
Speltz has been tried quite extensively, and where obtainable at a low price may be used at a profit. Its feeding value is about three-fourths that of the more common grains.

Screenings from the elevators and flour mills sometimes have considerable feeding value, but sheep seem to use these screenings to better advantage than steers, and for that reason they are nearly always used for fattening sheep or lambs rather than fattening cattle, in spite of the fact that they are quite successful for the latter purpose.

In the early days when bran was almost unsalable throughout the western states it was quite successfully used for fattening cattle. Because of its bulky nature it is too much like hay, and hence not so good for fattening cattle as for dairy stock, and as a result is now used almost entirely for dairy cattle rather than for fattening purposes. Middlings are rather too heavy and pasty a feed for fattening cattle, and their value for hogs makes the price prohibitive to the steer feeder.

Protein concentrates, such as oil meal, cotton-seed meal, or gluten feed, have little value in the West and are not used at all. The real need in western cattle feeding is a cheap grain. Any of our common grains would be satisfactory if they were not so high in price.

When It Is Advisable to Feed Cattle. For a man who raises neither hay nor cattle to go out and buy both, unless he expects to get some value out of either the clean-up or the manure, would not usually be advisable. But the ranchman who raises his own hay, or who raises his own cattle, and can get hay at a reasonable price and close enough to feed on his own farm, will often find it profitable to feed, providing, however, that he likes cattle and is willing to study them and follow the markets carefully. Cattle feeding is an attractive and profitable business, but no child’s play; and it takes but a very small break to lose a whole crop of hay. The successful feeder will usually be found very much interested in his work, and eager to talk cattle at any and all places. There is a certain fascination about handling cattle which, when once felt, is hard to escape.

Chief Cattle-Feeding Districts of Oregon. Practically all of the alfalfa-growing districts of Oregon may be considered as good locations for cattle feeding, and we do actually find large numbers of cattle being fed in every locality where alfalfa is extensively grown. These districts, of course, are the irrigated valleys of Eastern Oregon. Among those valleys most prominent in the cattle-feeding business may be mentioned the North Powder, Grand Ronde, Wallowa, Malheur, Klamath, Ochoco, Trout Creek, and Butter Creek. In Lake and Harney counties there are thousands of acres of wild hay, most of such hay being used for winter stock cattle, but seldom for fattening purposes, although there are a few hundred cattle in those counties fattened on wild hay in winter. There are also a few scattered feeding districts in the wheat belt, the Willamette Valley, and Southern Oregon. It is quite safe to assume, however, that at least 95% of the cattle fattened in the winter in Oregon are fattened in the alfalfa-growing, irrigated valleys listed above.
EQUIPMENT.

The equipment required for the raising of beef cattle is quite simple compared to the equipment required for the handling of many other kinds of live stock. Perhaps the first and most important is a saddle horse and lariat rope. As the industry grows and becomes more intensified, additional equipment is required. The next thing will be a good set of corrals, and these in turn will be supplemented by branding chutes and scales. Following these will come feed lots, with full equipment of feed racks and watering devices. Then will come hay cutters, and, in some parts of the country, silos. Barns, in Eastern Oregon, would come last, since no cattle are kept under roof in that part of the country. In Western Oregon, however, it is customary and desirable to keep practically all beef cattle under shelter during the winter, at least while being fed. From a business standpoint the first point to consider in the erection of a beef-cattle barn, is to see that it is convenient, and that it does not require an investment so large as to take off all the profits from the industry. There are so many forms of cattle barns that it is hardly well to recommend any particular style. In general, however, a beef-cattle barn should allow about 3 feet of rack room and 60 to 75 square feet of floor space for each mature animal. This will apply to dehorned cattle. Cattle with horns will require slightly more, and in fact it is not very convenient to keep cattle with horns in barns, regardless of space. Stanchions or other means of tying cattle are never used in the case of raising commercial beef. Neither are floors used, although the dirt floors are generally kept pretty well bedded. By putting in additional bedding from time to time it will not be necessary to clean the floors oftener than once every three or four months, and in some cases they may be allowed to go all winter. In building cattle barns no provision need be made in the effort to keep the barn warm, but only to keep out the wind and rain. Storage room must be provided for plenty of hay. This will be from about 500 to 1000 cubic feet of mow room for each head, and in case of animals that are to be fed heavily even more than this amount.

Fencing. Without question the best fence for cattle is a good, woven-wire type, about 40 inches high with a barb wire on top about six inches above the top of the woven wire. Such fences are often too expensive for commercial cattle so that as a matter of economy we are obliged to resort to the old-time barb wire. Three barb wires make a fair cattle fence, but not one that is really satisfactory, especially for calves. Four barb wires, however, make a strictly first-class cattle fence for enclosing large pastures and ranges, although it will not turn calves or any other kind of cattle if they are crowded into a corner. Five barb wires make a slightly better fence for cattle than four, but hardly enough better to justify the expense of the additional wire. Furthermore, this extra wire at the bottom of the fence makes it much more dangerous for horses. A three-wire fence, in fact, is much safer for horses than one with four wires. The posts for such fences are ordinarily placed about a rod apart, and this is close enough
for all ordinary purposes. A three-wire fence stretched very tight is better than four wires a little slack.

Corrals. In the building of corrals of any kind the first and most important consideration is to build them so that the cattle cannot possibly get out. This seems simple enough, but unless one is fairly familiar with the handling of cattle he will underestimate the ability of the average steer to get out of a corral. The fence must be at least six feet high and exceedingly strong. There are four common ways

Fig 9. Two Modern Methods of Building Corral Fences.

of building corral fences. The first is by putting up a pen of heavy poles, having the ends rest one on top of the other between pairs of heavy posts tied together with wire, thus building up the fence after the manner of building a log cabin. If the fence is well made, this is a splendid method, and is especially adapted to small, round corrals. For long, straight corral fences, it is not so satisfactory unless the posts are exceedingly heavy.

The second method is that used by all the leading stock yards. In this style of fence the posts are set deep in the ground, about eight feet apart, and six feet above ground, with boards nailed crossways.
The boards are 2 inches thick and not less than 8 inches wide, and from three to six inches apart. They are always placed on the inside of the post, and in case of division fences on both sides. This is the most expensive under the average farm conditions, but at the same time most expensive under the average farm conditions, but at the same time not sufficiently expensive to prevent its use. In fact, where the material must be brought, it is about as cheap as any.

The third common method is a plain board wall, made perfectly tight out of inch boards set upright. The posts are set eight feet apart, with crossbars, to which the upright boards are nailed. When built in this manner, the fence does not have to be nearly so strong as where it is made open so that the cattle can see through. If the cattle can neither see over the fence nor through the cracks, they will not make nearly as much effort to get out as where they can see. This type of fence also serves as a wind-break, which is often of great advantage when built around the barns or as a feed-lot fence in a windy country. It can also be made to look very nice, especially when the boards and crossbars are made of dressed lumber and nicely painted. This style of fence is not used nearly as much as it should be.

The fourth method of building corral fences is the old-style stake fence, formerly quite common in the range districts. This style of

![Fig. 10. Primitive Corral Near Prineville.](image)

tops were commonly fastened together with raw cowhide. This style of fence was especially popular in the semi-desert regions where good fence is built of posts only and has no crossbars of any kind. The posts are set as close together as they can stand, and are made as high as desired. Usually the tops are wired together by one or two wires running around the top. In the early days of the range industry the
posts or lumber were practically out of the question, and where the only building material obtainable was scrawny juniper or willow poles. This style of fence is very strong, and there is no fault to be found with it from the viewpoint of holding the cattle, but where lumber or straight poles may be obtained at a reasonable price other forms of fences are usually cheaper and more satisfactory.

The shape of the corral will depend upon its use and its location with reference to other corrals, chutes, barns, sheds, etc.; but other things being equal, the nearer round the better. With any other shape the animals will crowd into the corners and may injure each other or break the fence, while in the round corral they keep going around in a circle and find no corners to stop them. In roping corrals, this is especially important, since if the corral is of the proper size the roper may stand in the center while the animals chase around the outside, giving him a fair chance to throw. With the rectangular corrals the cattle jam into the corners so that it is almost impossible to get at them with the rope, and if they are not already in the corner, as soon as the rope is thrown they make a wild rush; if the corral is not wonderfully solid something will give away. On most farms it will be necessary to have more than one corral so that the animals may be separated into different bunches. The corrals should be separated by suitable gateways, and the branding chute should also open from one to the other. If the two main corrals can be separated by one or more small pens it will be a great convenience, since a few animals can be run into the small pen and there separated or run into the branding chute much easier than directly from a large corral containing a hundred or more cattle.

Where it is necessary to do so much roping either for branding, castrating, or otherwise, a small branding corral with a snubbing post in the center will be necessary. The snubbing post must be heavy, set well into the ground, and thoroughly tamped. The height will vary according to the fancy of the user, but 3½ to 4 feet is usually about right. The branding corral itself must be circular, without sharp corn-
ers or other projections. The diameter will depend to some extent upon the number of animals to be held, but for good work 30 to 60 feet will be found to be the best. The roper should be able to stand in the center near the snubbing post and catch the individual desired as the animals pass around the corral. If the corral is smaller than the limits given, there will not be enough room for good work; and if larger, the roper can not reach all parts of the corral from the snubbing post. For general use the fifty-foot size will probably be the best. If a larger number of cattle are to be handled than can be held conveniently in a fifty-foot corral, two small corrals will be very much better than one large one; in fact, two are always better, regardless of the number of cattle handled. There is no greater convenience on the stock farm than a double corral that can always be depended upon to hold anything and everything that is put in it.

Stock Scales. The old system of selling cattle by the head is disappearing so rapidly that every well-equipped stock ranch should now have wagon and stock scales. Where such scales are intended for stock use only, or for wagon use only, the location and equipment is easily arranged; but in case they are to be used for both cattle and wagons, some little study and ingenuity may be required to place them so that both may be weighed conveniently. It will be necessary, of course, to have them placed adjoining the corrals or chute so that the cattle may be run on them without difficulty or inconvenience. It is often as hard to put a steer on the scales as it is to get him into the branding chute. The scales, moreover, must be placed in such a manner that the stock rack may be removed and wagons driven on. The make or kind of scale is not so important, as nearly all of the standard scales now upon the market give very good satisfaction. Between the pitless scale and the pit scales, when one is buying, it is largely a question of which kind one can afford. The old type of pit scales doubtless lasts longer and gives rather better service than the pitless scales, but they cost a good deal more. Not only is the first cost of the scales greater, but the cost
of installing them will be fully equal to the original cost of the scale itself.

After the scales are properly installed, the next thing to prepare is the rack for holding the stock. There are various plans for building these racks, but the good ones are very much alike. The essential point is strength. If you have never built a rack for weighing cattle, it is a safe rule to build one about three times as strong as you think is necessary. The common method of building is to use 4x4's for the posts; using four or five on a side. These posts are made 8 feet high so as to give room for bracing across the top. Across the top put 4x4's notched to take the posts and then brace from the center of the top piece to the side posts about 1 1/2 or 2 feet from the top. For siding, use 1x6's about 2 inches apart at the bottom and gradually widen until they are about 6 inches apart at the top. Make the gates of similar material, using 4x4's for the framework. It is the common practice to make a gate at each end of the scale rack so that the cattle may be run in at one gate and out at the other. This is not absolutely necessary, since if the corrals are properly arranged the cattle may be put on and off at the same gate, yet without mixing the cattle that have been weighed with those that have not been weighed. By having only one gate the rack may be made considerably lighter and at the same time very much stronger than where it is necessary to make a gate at each end. Where it is expected to weigh both wagons and cattle on the same scales it is quite essential to have a cattle rack that may be removed from the scales with comparative ease. In this case the best method is to set the rack on runners, placed crosswise of the scales. About three runners, one at each end, and one across the middle, will be satisfactory. These runners may be made of 4x4's and the upright posts fastened solidly to them. In order to keep the scale racks from slipping off the scale platform, bore a hole through the middle of each end runner and on through into the scale platform. Loose bolts dropped into these holes will prevent the racks from slipping. The ground to the side of the scale platform should be leveled up to the same height as the platform, and when it is desired to move the rack it can be slipped off to one side. Wheels or rollers are sometimes put under the rack in order to make it move easier, but this is unnecessary, since two men can move off the scale platform without any difficulty, such a rack as that described.

The cattle corrals should be on the side of the scales next to the box and about as close to the box as will permit easy access to the beam. The gate from the corral or chute to the scales should be placed just in front of the scales, and made about 8 or 10 feet wide. The gate may then be swung outward to meet the scale gate, and by fastening the two together a chute is formed direct from the corral to the scale rack. Yet when the gates are closed and the scale removed, there is nothing to prevent easy access of wagons and teams to the scales.

If the scale rack is made quite high and with a gate at each end, a team and wagon may be driven through without removing the rack, but this arrangement is useful only in weighing small loads of grain;
it cannot be utilized for loads as large as a load of hay. Cattle racks are sometimes made with the sides hinged at the bottom so that they may be dropped back far enough to allow a load of hay to drive through. These racks, however, are practically never strong enough to hold wild cattle.

Especial attention should be given the arrangement of the corrals, so that the cattle may be brought to the scales with the least amount of difficulty. Not only does running the cattle around the corral waste a good deal of time, but it likewise runs the flesh off the steers and causes a good deal of shrinkage. If the corrals are so arranged that the cattle may be weighed without running them around or exciting them in any way, they will often weigh as much as 5 or 10 pounds a head more than if weighed from corrals that require a good deal of running to get them on the scales.

**Branding and Marking.** The branding of cattle is such a simple operation as to need very little elaboration in the way of explanation or instruction. The difficult part of the operation is usually to catch and hold the animals. On the open range this is usually done by roping by the neck and by the hind legs. Then, by pulling in opposite directions, the animal is thrown and stretched out in such a position that it is impossible for him to make much of a struggle when the iron is applied. This method has the advantage of requiring no corrals or chutes, but is slow; and is hard on both the calves and the horses. It also requires some skill in roping, although if the operator is used to handling a rope, it may be about as easy to get the rope on as to get it off. A great deal of branding is done by a method that is similar except that a stout corral and a snubbing post are used. The animal is roped by the neck or horns and snubbed to the post in the center of the corral. Then a rope is put on the hind legs, usually by throwing it over the rump when the animal can be made to move around a little so that he will soon step into the rope. Then with a flirt and a quick jerk the rope is dropped down around the hind legs and drawn tight. By a strong pull with a horse, the hind legs are pulled from under the animal and he is thrown and held while being branded. This method is not at all difficult, the only trouble being that if the rope is not properly managed when it is dropped down off the hips the animal may kick out of it with one foot, if not with both. The method is not very fast, and is hard on the animals, causing a good deal of excitement in catching, and also wooling them around more than is desirable. It is, however, convenient for the farmer who has only a few to brand, or where castration is done at the same time.

The modern method of branding, however, is with a “mash” or chute with movable sides. This method of branding is faster, and easier on the animals than the roping process, although this depends largely upon the conveniences that have been arranged for getting the cattle into the chutes. If the corral is large and only a short wing of twenty-five of thirty feet is used, there will be a good deal of trouble persuading the meaner cattle into the trap; but if a larger wing is used, and especially if it is divided into one or more small corrals, the cattle can be put in as fast as the iron can be applied.
In regard to branding irons, the essential point is that the design be simple and the iron large. Small complicated designs are easily blurred out, and even if they are put on all right, long hair soon covers them over so they cannot be read. A good brand must above all things be legible. A brand that can not be read until the animal is sheared is an abomination. If the iron be large and simple and properly applied, the brand should be legible all the year round. The actual size will depend on various things, but in general each letter, if letters are used, should be 7 or 8 inches high and M's and W's even larger. The stock of which the brand is made should also be large, ⅞ to ⅞ inch across the face. The depth of the stock is not so important, but if it is an inch or more the heat will be retained better. Copper is by far the best material for making irons, since it holds the heat much better than iron. It is expensive, however, and if the heating facilities are good and the branding not carried on with extreme rapidity, iron instead of copper will answer very well. For heating the iron, a large hand forge is the best, but they are not always readily available. Old stoves are sometimes used, and quite successfully. The common method, however, is the open bonfire, which does very well, but is troublesome and takes a lot of good, dry wood.

The temperature of the iron has much to do with making a permanent brand. Long-haired cattle require a much hotter iron than short-haired ones. In all cases the iron must be hot enough to make a good blister everywhere it touches, which usually means a good red. There is very little danger of getting the iron too hot, but much danger of not having it hot enough. The injury to the animal may be greater with the moderately hot iron, since it is often held to the skin for some time, and although the skin may not be much affected, the heat has time to penetrate to the tenderer tissues beneath and really do more damage and cause the animal more suffering than if the skin were burned to a crisp by the almost instantaneous application of white-hot iron. This same principle is well illustrated in horse shoeing. Veterinarians know that serious injury to a horse's foot seldom comes from the application of a red-hot shoe, for the scorching warns the shoer to take it away, but the serious injury comes when the shoe is not quite hot enough to scorch, and is therefore left in contact with the foot long enough for the heat to penetrate into the tenderer tissues below, thus producing serious and lasting injury.

With horses, the brand is applied almost instantly, but with cattle the iron must be held to the skin for a moment, since it takes a little while for the hair to burn through. If the iron is real hot, however, the work is done as soon as the iron strikes through the hair. Do not be satisfied, however, with brands that only affect the hair. They look all right, but in the fall you can not find them.

Another very important factor in making a brand legible, is the way the animal is held. If held absolutely solid so that he cannot jump around and cause the iron to slip, a good brand can be made; but if he can move at all, a blur is sure to result. One of the strong points in favor of the chute method of branding is that the animals can be held more securely so that there is less danger of blurred brands.
A word concerning the location of the brand may not be amiss. The common locations are the hips, thighs, sides, and shoulders. Of these the hips and side are by far the best. Between the two, the preference is for the hips. When animals are running out in the open, a brand on the side can be more easily seen; but when crowded together in a corral or cutting pen, the hip brand is more convenient. If the brand is placed on the side it must be well up toward the backbone, for otherwise it cannot be seen when the animals are crowded. A larger brand can be placed on the sides, however, than on the hips, although a brand larger than can be put on the hip is seldom necessary. The shoulder presents an excellent surface on which to put a brand, but the animal must stand broadside toward you and there must be no other animals in the way or the brand cannot be seen. The thigh brand, also, cannot be seen when the animal is in a bunch. This is a very important consideration, since it is essential that the brands be in view when the cattle are corraled for cutting out and separating. The whole object of branding is so to mark the animals that their ownership may be known at all times, and to accomplish this it is necessary that the brand be large and plain and on a spot where it may be easily seen when the cattle are bunched together. In making the brand legible, then, the essential points are a large iron of simple design, made of good, wide stock, applied red hot when the animal is held so as to be absolutely immovable.

Ear marking is practiced by many cattle men in addition to branding. Various slits and notches are made in the ears, according to the fancy of the owner, he, of course, adopting one certain form as his particular mark. The number of combinations are limited, so that only a comparatively small number of stockmen can have different ear marks. They are also in some cases easily changed. For instance, a man whose mark was a crop off of both ears could change any of the common marks into his own. Ear marking is not then a substitute for branding, but a supplement thereto. Calves can be and should be marked as soon as they come, but they would be in no condition to withstand branding at this age. They are thus marked at the age when there is the most danger of being lost or stolen. The ear mark is also very convenient as a supplement to the usual brand on matured cattle and affords a double means of identification. It is also more legible than the brands, especially in the dead of winter when the hair gets long. In looking over a bunch of steers, the owner knows that those without his mark on the ears are not his, without going to the trouble further to identify the animal by examination of the brand.

Oregon Brand Laws. In order to have any legal standing in this State a brand must be recorded with the county recorder in the county where the owner resides, and in such other counties as the stock are allowed to run. No one is allowed to record a brand already recorded, except with written consent of the man who previously recorded the brand.

Ear marks may be recorded in the same manner as brands. It is not lawful to cut off more than one-half of the ear, and it is not lawful to trim both ears to a point.
Owners of slaughterhouses are required to keep for public inspection a book in which are recorded the brands of all cattle they handle. Private parties slaughtering cattle are required to retain the hides intact for thirty days.

**Brand Inspection.** In nearly all of our large live-stock markets there are men known as brand inspectors, whose business it is to examine and keep a record of the brands of all cattle sold from the different parts of the country. These men are usually employed by the cattle-raisers' associations. For example, in the Chicago and other eastern yards, the state cattle-raisers' associations in each of nearly all of the western states have a brand inspector to examine all cattle coming from that state. In this State we have an association known as the "Cattle and Horse Raisers' Association." This association employs an inspector at the Portland Union Stock Yards, whose duty it is to keep a record of the brands of all cattle sold at the Stock Yards, and to report to the association the sale of any cattle bearing the name and brand of the association for which a proper bill of sale is not furnished. This association has been organized only a comparatively short time, and the inspector has been at the Stock Yards only during the past few months. The object of such brand inspection is not so much to prevent cattle stealing as to aid in rounding up the cattle. On the large ranges it is practically impossible for any one cattle man to get all of his cattle, and some of the strays may be picked up by parties who do not know the brand, and have no way of ascertaining to whom the cattle belong. When these are shipped to the stock yards, the brand inspector, who has a complete record of the brands of all the members of the association, can straighten out the matter at the yards. In the eastern stock yards the inspectors are very strict in this matter, and will not allow the sale of any cattle bearing the brand of anyone else than the shipper, unless the shipper is provided with the proper bill of sale from the owner of that particular brand. In case the owner does not have such bill of sale, the money resulting from the sale of such cattle is refunded to the cattle-raisers' associations, and from there forwarded to the owner of the brand. The regulations in this State are as yet not nearly so strict, although they are working in that direction.

**Marking of Pure-Bred Cattle.** Pure-bred cattle do not ordinarily require branding in order to establish the ownership as in the case of commercial cattle. It is necessary, however, to give each animal some number or other identification mark in order that an accurate record may be kept of the breeding. There are two common methods of marking pure-bred cattle. One is to put a small aluminum button in the ear, such buttons bearing the initials of the owner and the number of that particular animal. The other method is to tatoo the number in the ear. The latter method is by far the most permanent, but has the disadvantage of being difficult to read. In addition to these methods some breeders brand the number on the horns. In this case, if the horn is broken off the number is lost. Such a number is very easily read, and some of the breeders put the tattoo mark in the ear in order to have a permanent mark, and then also put the same number on the horn so as to have a mark that is easily read.
GLOSSARY.

Aberdeen Angus—A breed of especially good beef cattle of somewhat widespread distribution throughout the Central states, but not common in the West. Are distinguished by their extremely low set, blocky form, their jet black color, and the absence of horns.

Beef Cattle—A stockyard term used to designate all steers suitable for slaughter purposes, as distinguished from steers not fat enough or old enough to slaughter, and as distinguished from all classes of cows, heifers, and bulls.

Bos—Bos is the zoological name for the particular genus of the animal kingdom to which cattle of all kinds belong.

Bovine—Of or pertaining to cattle; derived from the word bos.

Butcher Stock—A stockyard term used to indicate all classes of cows, heifers, and bulls used for slaughter purposes. (See beef cattle).

Calf—The young animal of the bovine species without regard to sex, usually under 12 months of age. Animals born during any one calendar year are ordinarily called calves until some time the following spring.

Canners—A market class of very inferior cattle, usually old, thin cows, used for canning purposes.

Cow—The female of the bovine species after she has produced her first calf. Sometimes in the case of pure-bred herds the term cow is not applied until after the female has produced her second calf.

Docking—The practice of deducting from the weight or price of an animal at time of sale, for any purpose whatever. Cattle sold out of the feed lot when full of feed and water are commonly docked 4 per cent in order to give the buyers some discount for the great shrinkage which will occur in getting these animals to market.

Dressing percentage—The weight of the carcass of the beef animal expressed as a percentage of the live weight. In dressing beef animals, the head, hide, feet, and entrails are removed. The average dressing percentage of good steers is from 55 to 58 per cent and of cows 4 or 5 per cent less. Very poor or very good animals dress out considerably more or less than the figures given.

Durham—An old but now practically obsolete name for the Shorthorn breed of beef cattle.

Feeders—Steers that are not fat enough to slaughter, and yet are old enough and large enough to be ready to fatten off without further growth on range or pasture. Ordinarily steers that are two years old or over and weigh over 950 pounds will be designated as feeders unless they are fat enough for slaughter, in which case they would be designated as beef cattle. (See beef cattle).

Galloway—A well-known breed of black, hornless, beef cattle. Very similar in general description to the Aberdeen Angus. They have not quite as wide distribution in the United States as the Angus.

Grade—This term is often applied to any animal which is not pure bred. It is more correctly used for stock that carries a considerable percentage of the blood of some one of the improved breeds, but not
entirely of that breeding. Example; the offspring resulting from the breeding of pure-bred sires to common females.

Heifer—The female of the bovine species that has not yet produced a calf. (See cow).

Hereford—One of our well-known breeds of beef cattle. Especially popular in the range districts. Distinguished by their bright red color, with white faces and some white on the underline and feet and legs.

Mongrel—An animal of nondescript or mixed breeding. Usually used in a derogatory sense.

Polled—Without horns. This term is often used as a suffix to the name of some of the breeds of polled cattle, as for example, “Polled Angus,” “Polled Hereford,” or “Polled Durham.”

Pure Bred—An animal carrying only the blood of some one breed. The dividing line between those that are pure bred and those that are not is usually considered to be registration, or eligibility to registration, with the particular breed association having charge of the registration of cattle of that particular breed.

Scrub—An animal of inferior merit and usually of mongrel breeding.

Shorthorn—One of our best known breeds of beef cattle, although used to some slight extent for dairy or dual purposes. Colors run red, white, roan, or red and white spotted, no distinction being made in colors other than personal preference.

Shrinkage—The loss of weight occurring in the driving, shipping, or handling of cattle. Shrinkage is a particularly important item in the marketing of beef cattle, and must always be taken into consideration in comparing the prices per pound at home with the prices offered at the stock yard.

Stag—A male animal of the bovine species which has been castrated after the animal is old enough for more or less masculine character of the head and neck to become noticeable.

Staggy—Having more or less of the appearance of a stag. The degree of staginess is of course controlled by the age at which the animal was castrated.

Steer—A male animal of the bovine species which has been castrated before the animal is old enough to show any masculine character, as indicated by coarse head and heavy neck.

Stockers—Young growing cattle, including both steers and heifers; steers not old enough for feeders (See feeders) and heifers not old enough to produce their first calf. The term, however, is sometimes used to include the entire breeding herd of cows as well as the young steers and heifers.

Thoroughbred—A term often used as synonymous with pure bred, but generally considered as incorrect when so used, and should be properly used of a breed of horses.

Veal—A young calf fat enough to slaughter, and weighing between 125 and 300 pounds live weight.