OREGON offers greater advantages to successful dairying than any other state in the Union, and greater than any country in the world, the Channel Islands, the home of the Jersey and the Guernsey, not excepted. Its equable climate not only meets the temperature requirements of butter and cheesemaking, but favors the growth of green food almost the year round, as well as saves much food required to sustain animal heat East of the Rocky Mountains. Until recently it was thought that there were few localities east of the Cascades that were adapted to dairying on a large scale. But dairying is doing well there and some parts of Eastern Oregon have butter for export, whereas only a few years ago they imported the bulk of their dairy products.

Dairying has long been established west of the Cascades and this division of the state is capable of increasing its output many times over. The most important districts are along the Columbia River, on both the Oregon and Washington shores, and on the islands, from the Cascades to the mouth of the river, a distance of 120 miles. This district includes hundreds of thousands of acres of native grass lands, and lands that grow the most nutritious hay and pasture grasses as well as clover, peas, Winter oats, vetch, corn and roots.

The counties bordering on the Pacific Ocean—Curry, Coos, Douglas, Lane, Lincoln, Tillamook and Clatsop—extending from the California line to the Columbia River, a distance of 280 miles, are a dairy empire unexcelled anywhere in the world. Their dairy acreage extends inland from the coast from one to 30 miles. Along this strip the climate, as in the Willamette Valley, is governed by the Japanese current and is so invigorating to plant life that the ground is matted with green grass all the year. Food supply is the least consideration of the dairyman in this belt. All that is required of him is that intelligent management of the herd which shall produce the greatest flow of the richest milk.

While the Willamette Valley counties are not so richly favored with native grasses as the ocean counties, they are none the less a dairying country. They have the domestic grasses, clover, corn for fodder, peas, rape, vetch, cabbage, Winter oats and the roots. Farming land is more valuable in the Willamette Valley than elsewhere in Oregon and for this reason dairymen are compelled to economize their resources. The silo is in high favor and there is perhaps not a dairyman in the business who has made experiments looking to the production of sufficient food on an acre to support a cow for a year.

Recent Dairy Development.

Manufacture of butter and cheese has been carried on in Oregon ever since the state was settled, but the product was principally for home use. Only in recent years has there been manufacture for export. Dairying has found favor in the Willamette Valley partly because of the profit there is in it and partly because the exhaustion of the soil by continuous wheatplanting has made general farming less remunerative than formerly. The first settlers, surprised by the large crops that resulted from successive cultivation, and even without cultivation, readily believed that there was no limit to the productive capacity of the soil. Farmers who came in comparatively recent times, even men whose experience had taught them that no soil was inexhaustible, followed in the errors of the pioneers until it was accepted as an article of faith in Oregon that no matter what crops were raised, nor how many times the same crop was raised on the same area, the vitality of the soil could not be impaired. Thirty years ago the average yield of wheat to the acre in the Willamette Valley was close to 25 bushels. Yields of 50 bushels to the acre were not uncommon, just as reports are now and then made of yields of 70 bushels per acre on virgin soil in Eastern Oregon that has been irrigated for the first time. Thirty years ago volunteer wheat not infrequently went 30 and 40 bushels to the acre.

Continuous crops of any kind will drain any soil, and continuous crops of wheat have impoverished the soil of the Willamette Valley. Instead of the 25 bushels to the acre of 30 years ago, the average has fallen to less than 16 bushels. Few estimates go above that figure, but many are below it. Some say 15 bushels, and others estimate 12. At 12 bushels to the acre there is no profit in exclusive wheat farming with wheat at 50 cents a bushel. One acre nets the producer $6, gross. One hundred acres, $600, gross. Out of this maximum return the farmer must pay all the expenses of the farm, including cost of seed, planting, harvesting, household expenses and interest on any debt he may have.

The logical result of the unshakable faith in the fertility of the soil has been wheatplanting year in and year out. Nearly 75 per cent of Willamette Valley soils are of the red acid variety. The soils, whether of red or black loam, are deficient in potash. They never were very strong in this ingredient, because the parent rock from which they were formed is deficient in it. Besides, the heavy rains wash away 25 per cent of the potash. This loss is constantly going on, whether the land is growing crops or not. Under draining would prevent much of the waste of potash. No section needs under draining so badly as Western Oregon. Vitality thus run to waste can be restored only with commercial fertilizers. Leguminous crops are but a temporary relief. They cannot keep up the fertility on the side of potash.

Managing a Dairy.

The impoverished condition of the soil and the consequent unprofitableness of exclusive wheat production have at last directed attention to diverafied farming in general and to dairying as the branch which promises the best returns for the most intelligent management and the least tax on the soil. Years ago an effort was made in behalf of dairying, but it failed because wheat-growing was still a profitable and easy method of making a living. Then the Dairymen's Association grappled with the problem and all but failed for lack of interest in its organization and work. Change of agricultural conditions has been followed by a change of sentiment in regard to dairying, and the industry may now be said to be permanently established and its proportions to be enlarging. The disposition among men who have taken up dairying as a special pursuit and those who have adopted it as an adjunct to the farm, is to learn all there is to be learned about the dairy cow and to apply the knowledge where it will do the most good.

Success in dairying depends upon three essential factors which are inseparably linked. These are: First, cows that will give the highest per cent of butter fat, coupled with the largest flow of milk. Second, careful, one might almost say, scientific, management of the herd every day in the year. Third, production at a cost which will insure profitable marketing.

The selection of the herd is all important. There are those who maintain that the ordinary cow, under proper conditions, is the most profitable for the beginner, but this theory is not borne out by experience. It costs just as much to feed a poor cow as a good one, and there is no getting away from the fact that a good cow brings in more money than a poor one. The main idea is to make a good beginning, and this cannot be done with scrub stock. No careful farmer will stock up with cows which he knows the first weighing and Babcock tests will show to be unprofitable. The object of the dairyman should be to build up the herd with cattle that are considered thoroughbreds, and having once selected a breed to adhere to it. Scrub cows are not given consideration in communities where dairying is a business.

Principal of the details of management is the utmost cleanliness about the cattle, their attendants, the stable, the dairy and all utensils. A cow should be milked at the same time every day and by the same person. Food should be carefully compounded and fed at the same hour daily and in abundant quantity. Cows should be fed all they will eat up clean, but such generous feeding should never be inaugurated until after they have advanced far in the period of lactation, because otherwise the animal will not increase in flow of milk, but will begin laying on fat. The reason cows should be fed all they will take is that they must first be provided with enough food for bodily maintenance, and the more they will eat in excess of this quantity the more they will have for conversion into milk.

An Oregon "Balanced Ration."

The profit in dairying, as in any other manufacture, is dependent upon the margin between the market price of the product and the cost of production. It is therefore of primary importance to provide feed at the lowest cost. When grain is relatively high it may become necessary to discard farm grains altogether, sell them and buy mill feed. Cost of production depends solely upon knowing how to compound a balanced ration, the dairy name for one day's food for a cow. Probably not to exceed one person in 75 knows how to do this. The balanced ration which experiment has proved is best suited to Oregon is thus compounded: Ensilage, 30 pounds; clover hay, 6 pounds, barley meal, 4 pounds, or 2 pounds of oil meal; bran, 8 pounds. This ration contains 23.75 pounds of dry matter, 2.11 per cent of digestible protein, 12.81 per cent of digestible carbo-hydrates, and .63 per cent of digestible fat. A day's food, no matter what its ingredients, should not cost over 19 cents. When it exceeds that figure the cow begins to "eat her head off." G. W. Weeks, of Salem, is a firm believer in the theory that one acre can be made to produce enough food to feed one cow for a year, and has probably made more experiments along this line than any other dairyman in Oregon. He says this economy is possible only by soiling, which he practices. Ensilage, he says, will be the salvation of dairying in Oregon. It is the only thing that will successfully bridge over the dry season. By this policy he gets a large and continuous flow of milk from each cow for 10 months in the year.

Mr. Weeks' experience is that the vetch gives the best results for early Spring feeding. It is sown about October 1. All farm stock relish it. A drill is used for seeding and two bushels are sown to the acre, with three quarts of rye thrown in for a prop. Rye is the only grain that will reach above the vetch and hold it up. The next best crop is the pea, which is sown with a drill early in the Spring. About 2½ bushels are planted to the acre, put in as deep as possible. Afterwards the pea land is cross sown with a bushel of oats to the acre, which is harrowed in. Mr. Weeks has been able to get better results from this combination for Summer feeding than from the vetch, though the latter makes the best early Spring feed. If a dairyman wishes to soil all Summer, it is advisable to sow one crop in March, another in April and so on as long as the grain will grow. Mr. Weeks plants corn in May. He uses a two-horse planter, and the person using the dropper pulls the lever at each step of one of the horses. This makes the hills about 2½ feet apart, with two or three kernels in a hill. The growing crop is carefully cultivated with a reversible harrow. After the corn gets too large to harrow, the corn plow is used once a week. Corn is fed to the cows as soon as it is large enough for roasting ears, being prepared by running through an ensilage cutter. Oats make a good soiling crop, but it is very expensive. All kinds of vegetation can be used in the silo as well as for soiling.

"How cheaply can I produce a pound of butter fat, or 100 pounds of milk?" should be the first question with every dairyman. The man whose 100 pounds of milk cost him 30 cents, food values, gets no more for his butter than the man who got 100 pounds of milk for 20 cents. A good cow should give, when in her prime, 6500 pounds of milk a year. In Oregon the average at present does not exceed 5000 pounds, and in the majority of cases it is less. Dairymen receive an average of about 80 cents for 100 pounds of milk.

Dairying More Profitable Than Wheat.

The difference between dairying and exclusive wheat farming is shown in a statement prepared by George L. Rees, of Albany. His first illustration is that of a farmer who comes to Oregon to engage in wheat-raising. He buys 160 acres of wheat land at $30 an acre, and this is how he fares with his investment, and the first crop:

Cost of land	$4,800 00
Seed wheat, 200 bushels	100 00
Three horses	220 00
Feed for horses one year	150 00
Harness	30 00
Wagon	80 00
Plow, harness and drill	100 00
Binder	340 00
Twine	25 00
Threshing	120 00
Shocking grain	15 00
Interest on investment	324 40
Cost of the first crop	$4,504 40
Credit—	
Crop of 2000 bushels of wheat sold at 50c	$1,000 00
Deficit	$3,504 40

The farmer goes into Winter quarters with a balance of $3504 40 on the wrong side of the ledger. His farm, machinery and horses have been paid for, but he will have to buy both feed for his stock and seed for the next year, for he has marketed all of his first crop. He would still be safe if he could continue to harvest 50 bushels to the acre, and his horses and machinery did not wear out. But he is not sure of any such yield, and the stock and utensils wear out from natural causes and must be replaced. At 50 cents a bushel the farmer receives from 2000 bushels, $1000. Of this he is entitled to charge $600 for wages, for he has to board himself. Add to this the $324 40 interest and there is a total charge of $924 40, which leaves the farmer $75 90, net, at the end of the year. This will not meet depreciation of the machinery and buy artificial fertilizers to keep up the fertility of the soil.

Mr. Rees figures that 50 acres will answer for a dairy and that $30 per acre is a good price. On this basis he makes the following charges:

Cost of land	$1,500 00
Seed corn for 25 acres	10 00
Vetches, oats and clover seed for 25 acres	20 00
Two horses	150 00
Feed for horses	150 00
Harness	20 00
Wagon	80 00
Plow and harrow	30 00
Cows, 25 at $30 each	750 00
Feed for cows per year, each $40	1,000 00
Amount of money paid out	$3,710 00
Interest on the investment	296 80
Gross cost	$4,006 80
Credit—	
Ensilage, 100 tons from 25 acres of corn	$ 500 00
Hay, 80 tons from 25 acres of clover and oats	400 00
Butter from 25 cows	1,500 00
Calves sold for veal	100 00
Gross earnings of dairy	$2,500 00
Deduct for wages	600 00
Net earnings	$1,900 00

Exclusive wheat farming and dairying are here sharply contrasted. On an investment of $4504 40, the wheat farmer gets a net revenue of $75 60, and on an investment of $4006 80 the dairy farmer gets a net revenue of $1900. Dairying nourishes the soil, and exclusive wheat farming impoverishes it. When the wheat farmer's stock and utensils wear out he has to stand the loss. When the dairyman's cows begin to wear out he can fatten them and sell them for beef.

Successful Co-operating Creameries.

The work of a few representative creameries in the Willamette Valley will be cited to illustrate the measure of success which attends intelligent dairy management in Western Oregon. Figures for 1899 will be used, as the statements for 1900 were not prepared when this article was written. In 1895 a co-operative creamery was established at Albany, with a capital of $5000. In 1899 it received the milk of 333 cows, from 52 patrons, handled 1,675,580 pounds of milk, and made a product from which it realized $18,227 18. Of this amount $14,450 19 was returned to the 52 patrons in payment for butter fat. The difference of $3786 99 represents cost of manufacture, transportation charges, interest on stock and amount laid aside each year to be applied toward taking up shares of stock outstanding.

Following is a statement showing the number of patrons, average number of pounds of butter fat to the patron per year, total amount of butter fat handled, and gross receipts of the creamery for five years:

	Patrons.	Av. lbs. butter fat.	Total lbs. butter fat.	Gross receipts.
1895	39	493	19,232	$ 4,106 82
1896	92	985	90,688	16,963 03
1897	62	1021	63,041	14,317 74
1898	48	1230	59,271	15,534 82
1899	52	1294	68,540	18,237 18

It will be seen that the average amount of butter fat per patron shows a steady increase, indicating that the farmers who are regular patrons of the creamery have been giving attention to the improvement of their cows.

A list of the names of 20 patrons taken from the books in regular order for the purpose of setting forth information in detail as to the amount of milk furnished by each, average test of cows, amount of butter fat, number of cows and earnings for the year 1899, makes the following showing:

NAME.	Milk, lbs.	Test.	Butter fat, lbs.	Cows.	Earnings.
Froman, T.	69,994	4.2	2886	10	$ 636 90
Froman, S.	90,430	4.2	3380	12	762 10
Payne, L. B.	30,635	4.4	1336	7	270 15
Freerkson, S.	66,024	3.8	2270	13	517 80
Miller, A. C.	70,280	4.6	3232	15	696 75
Matasce, G.	21,240	4.2	871	5	202 95
Allingham, W.	87,274	4.1	3532	17	779 15
Pugh, J. W.	70,942	4.7	3258	18	678 60
Sprenger, H. B.	21,154	4.8	984	6	216 90
Morgan, J. W.	20,258	4.1	800	5	168 85
Workinger, G. L.	32,311	4.1	1283	6	286 55
Brown, J. C.	32,843	4.7	1462	7	310 20
Bateman, N. H.	55,070	3.7	1992	13	415 15
Porter, F. H.	105,992	3.8	4076	15	865 35
McCormick, W. B	25,469	4.4	1501	9	258 90
Bither, P.	36,422	4.2	1536	9	320 00
Forbes, B. R.	35,324	4.9	1715	7	374 60
Sprenger, T. B.	14,197	4.2	599	6	127 60
Wilson, L. R.	28,148	3.7	1044	8	205 65
Davis, J. C.	13,166	4.3	902	5	186 45

These 20 patrons controlled 190 cows. The average milk test was 4.35, which is good. The average amount of milk per cow was 4953 pounds, and the average amount of earnings per cow $43 61. Both of these averages are low. In connection with a statement of this kind it must be remembered that some of the creamery patrons are in the habit of retaining at home the cream used by themselves for household purposes, which often makes a considerable difference in the total result.

It will be of interest to note the total business of 1899 as shown in the following statement by months, wherein is contained the total number of pounds of milk handled, number of pounds of butter fat, amount earned by patrons, number of cows and amount paid per pound for butter fat:

MONTH.	Milk, lbs.	Butter fat, lbs.	Amount.	Cows.	Paid for butter fat per lb.
January	98,073	4,024	$ 1,006 00	382	$0 25
February	90,757	3,681	920 25	383	25
March	133,154	4,780	1,242 80	230	26
April	145,179	5,756	1,063 64	267	19
May	211,803	8,631	1,294 65	426	15
June	297,930	8,292	1,243 80	434	15
July	194,356	6,427	1,285 40	429	20
August	117,029	4,804	1,008 84	401	21
September	123,603	5,456	1,091 20	394	20
October	141,087	6,201	1,488 24	398	24
November	120,816	5,439	1,414 14	335	26
December	116,783	5,049	1,361 23	314	27
Total	1,675,580	68,540	$14,450 19		

Average number of cows, 383; average price, 22 cents.

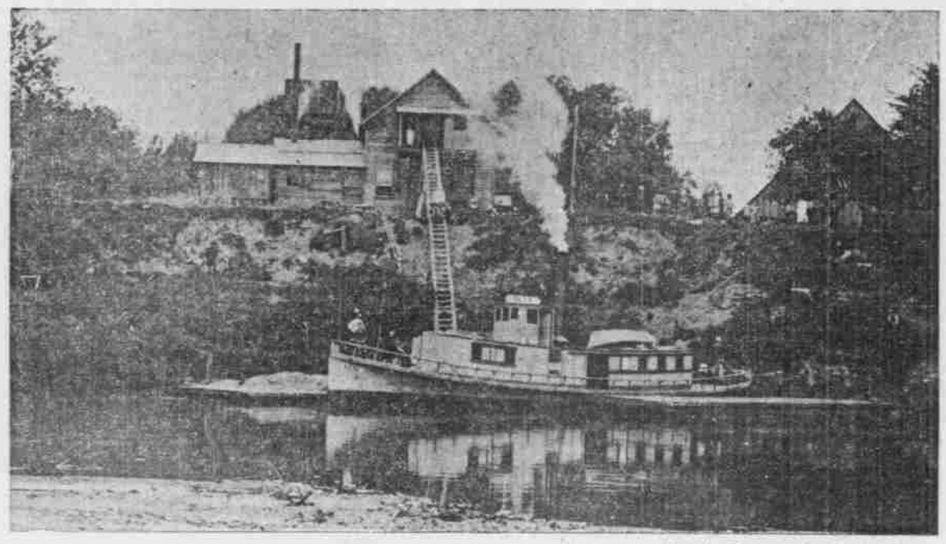

Photo by Ernest A. Stauff, Arago, Or.

A CREAMERY ON THE COQUILLE RIVER.

Small steamers and gasoline boats make daily trips along the rivers and sloughs of Coos County to collect cream for the butter and cheese factories. The farmers live along the banks of the waterways. One boat operates at an expense of $8 per day, and is able to handle the products of 100 farms. The cheap transportation thus afforded is one of the secrets of the success of the creamery business on the Southwestern Oregon coast.

TABULATED STATEMENT.

Capital invested	$ 5,000 00
Gross receipts in 1899	18,227 18
Cost of manufacture	2,364 82
Paid to patrons for butter fat	14,450 19
Average receipts for butter, per lb	23
Average cost, per lb	03
Average price paid for milk, per cwt	81
Average paid for butter fat, per lb	22
Earnings of average patron	278 00
Pounds of milk received	1,675,580
Butter made, lbs	78,821
Butter yield of average cow, lbs	206
Patrons of creamery	52
Average number of cows	383
Average number of cows per patron	7
Average test for butter fat	4.30
Average yield of butter, per cent	4.95

Better Than Minnesota.

As compared with the average co-operative creamery in Minnesota, the receipts of the Albany creamery show an increase of $3227 18; a decrease in the average number of cows of 150; increase in earnings of average patrons of $122; decrease in patrons of 26; increase in butter yield of average cow of 46 pounds; increase in average paid for butter fat per pound of 6 cents; increase in price paid for milk, per hundredweight, of 19 cents; increase in average yield of butter of .45; increase in average test for butter fat of 5 per cent; decrease in cost of making butter of .012; increase in receipts for butter, per pound, of 6 cents; decrease in pounds of butter made of 4779 pounds, and increase in amount paid to patrons of $1450.

The average patron kept seven cows and furnished the creamery with 22,322 pounds of milk, which brought for butter fat $278 per year.

Average cow supplied 4372 pounds of milk last year, which made 206 pounds of butter and brought the owner $37 73 for butter fat.

In Freeborn County, the parent county of Minnesota's co-operative creamery industry, and regarded as a model creamery county by the leading dairy authorities of Iowa, Wisconsin, Illinois and New York, the average patron kept between seven and eight cows, furnished to the creamery 33,000 pounds of milk, and received $220 for butter fat. The average cow furnished 4450 pounds of milk, which made 210 pounds of butter and brought the owner $39 40 at the creamery door.

Comparing the showing made by the Albany co-operative creamery with that of the average creamery in the best dairy county of the United States, it will be seen that the 22,222 pounds of milk from seven cows brought the Linn County farmer for his butter fat $58 more than the Freeborn County farmer received for his 33,000 pounds of milk from seven and eight cows, or an increase of $5 33 per cow.

Washington County Creameries.

Within a radius of 10 miles in the dairying section of Washington County there are three creameries, Farmington, Schulmerick's and Blooming, manufacturing a product from the sale of which is realized no less than from $20,000 to $25,000 per annum. Nearly all of this amount is distributed among the farmers patronizing the creameries in payment of the butter fat taken from the milk.

The Farmington creamery is owned and operated by a joint stock company whose 38 shares of $50 each are held by nine stockholders, all of them patrons of the creamery. This plant is daily receiving the milk from 120 cows, with an average test of 4.2 per cent butter fat.

The total business of 1899 is shown in the following statement, by months, wherein is contained the total number of pounds of milk handled, number of pounds of butter fat, number of pounds of butter made and total receipts therefor:

MONTH.	Milk, pounds.	Butter fat, pounds.	Butter, pounds.	Receipts.
January	73,258	3,012.9	3,518	$ 957 96
February	73,155	3,044.7	3,246	924 56
March	65,635	2,762.2	3,088	849 60
April	74,963	3,134.6	3,980	813 40
May	80,693	3,308.4	3,873	720 22
June	80,787	3,274.3	3,272	643 75
July	71,566	2,905.6	3,096	688 93
August	66,347	2,638.7	3,344	695 36
September	66,947	2,706.4	3,533	765 00
October	71,510	2,939.0	3,367	868 90
November	68,244	2,763.3	3,174	889 20
December	62,536	2,595.6	3,468	825 75
Total	855,745	34,942.6	41,499	$8612 66

Average test, 4.2 per cent. Average number of cows, 150. Average price of butter during the year, 21 cents per pound. Average earnings per cow, $57 42.

The results obtained by the Schulmerick creamery are just as good—6195 pounds of butter were manufactured, from the sale of which was realized $6000. The record of just one patron,—that of Mr. Schulmerick in 1899—shows that he furnished a total of 120,340 pounds of milk, testing 4 per cent butter fat, from which 5568 pounds of butter were made.

There are no creameries in the East, or in other sections of the Willamette Valley, which, generally speaking, show better results than those obtained by the Washington County companies, and with these figures it certainly that no one can question the profitableness of this branch of farming. It must be remembered that besides the direct returns from the sale of butter fat there is a considerable saving on the farm through utilizing the skimmed milk for hog feed, and also feed for raising calves.

Oregon's Wealth of Forage Plants.

Grass is the basis of all successful agricultural operations. Where grass has never grown, or where it fails to grow, there is no hope of securing any crop of value. In Oregon there are many varieties of climate, soil, geological formation and widely varying conditions, due to precipitation, elevation, proximity to mountains, coast, etc. All these have marked influence upon vegetation. In the eastern and southern parts of the state are found the more hardy bunch grasses, which have maintained themselves in these localities for ages, furnishing an almost unlimited source of luxuriant pasturage of high nutritive value. The pasturage of these regions is made up largely of a class of grasses noted for their ability to withstand extremes of drought, and when in a dry state furnish a source of pasturage for stock which is second to none so far as nutrition is concerned. This peculiar quality of the bunch grass is not present in the grasses of the Willamette Valley, which grow more luxuriantly.

It is said that grass attains this peculiar nutritive quality only when grown 3000 feet or more above the level of the sea. This elevation includes a large portion of the eastern part of the state, where these grasses furnish such an abundance of pasturage. While this range, which was once a vast public domain, open to any one who wished to use it, is now taken up, to a large extent, and controlled by private landholders, it is none the less important as a grazing country. It is true in many places that the once-flourishing bunch grass has been largely exterminated by the great flocks of close-nibbling sheep, yet it is still the principal source of food for thousands of cattle, sheep and horses.

The most important species under the head of "bunch grass" are found in the genera botanically known as stipa, oryzopsis, deschampsia, festuca and poa. These grasses cover the finer sorts, those which furnish a short, sweet and very nutritive pasturage. Of the coarser grasses, the blue joint furnishes several species. These are tall, stiff grasses, readily eaten by stock, and are very nutritious. Certain species of this grass are found in mountains, valleys and open prairies. Wherever found, it furnishes an excellent pasture grass, and when well cured makes good hay. When the smaller grasses on the range are covered with snow, these grasses furnish sustenance which can be more easily obtained.

Hay and Pasturage Grasses.

In the larger valleys there is found a great variety of grasses, more or less valuable for pasturage and hay. In the western portion, which receives a heavy annual rainfall, a more luxuriant but less nutritive herbage is found. In the Coast Range grasses of many kinds grow very rank, and the coarser species, those adapted to more moisture, are found in their greatest perfection. Among those very common in this region are the glyceria, agropyrum and beckmania. These are adapted to low, moist ground, along streams and in marshes. Wherever the underbrush is cleared away along the streams sufficiently to permit the sun to send his rays to the earth, these grasses will soon make their appearance. Specimens have been gathered from the Coast Mountains which measure more than six feet in height.

Several species of wild rye are found in various parts of the state; and, while not so nutritive as some of the smaller grasses, it furnishes a large amount of pasturage, and is often cut for hay. In Eastern Oregon it grows along the dry creek bottoms, and furnishes considerable Winter pasturage when the smaller grasses are covered with snow.

Cheat is a very common grass grown for hay throughout a large portion of the Willamette Valley. It is sown in the Fall with almost as much regularity as the wheat crop, and, when cut in season and well cured, makes a very fair quality of hay for horses. The average yield is from two to three tons per acre. The chief advantage of growing this grass is that it will produce a crop where other less hardy grasses would fail. Farmers are gradually learning that clovers and other grasses make a more nutritious ration, and are gradually discarding the use of cheat.

Festuca is a genus which covers a large number of species and varieties which are more or less valuable for pasturage and hay. Many of these grasses are found in Oregon widely distributed. One of the species of this grass has been termed "the great bunch grass." This grass is the most widely distributed of any, and is one of the most vigorous, hence its name. It grows in bunches or tussocks, which are difficult to cut with a machine. The grass is too coarse for sheep; but in Eastern Oregon it is one of the most important grasses for horses and cattle.

Sheep's fescue, which includes several varieties, is a very important pasture grass, found widely distributed throughout the state. It is found at high elevation in the mountains, and there furnishes a short, sweet pasturage for sheep and other stock. It is said to be the most wholesome and nutritious grass for sheep and cattle known. It is found growing with considerable vigor in dry, sandy soils. It is a very valuable grass to place in mixtures for permanent pastures. Its fine, short stems and leaves make a thick and firm covering over the ground.

Western Oregon Adapted to Fescue.

Meadow fescue is a very strong, vigorous grass, producing excellent pasturage, especially in Fall and Winter, and yields a very good quality of hay. It produces an abundance of seed, and on this account the seed is cheaper than that of many other desirable varieties. The soil and climate of Western Oregon are well adapted to the growth of meadow fescue. This grass occupies a very important place among the grasses used for hay and pasture in England, where a similar climate prevails to that of Western Oregon. It matures early, so that it might be sown with a mixture of orchard grass and clover. It will yield from two to four tons of hay per acre. It endures dry weather better than the smaller grasses. The roots run deeper into the ground than the roots of many other species.

Hard fescue, when thoroughly established, produces an excellent sod, and considerable pasturage. It is a valuable grass for pastures in the Willamette Valley and on the dryer hill pastures.

Red fescue grows well during the dry season, producing a fine and very nutritious pasturage. In forming pastures which will stand the tramping of animals, this grass should not be neglected, for it helps to form a thick, dense sod when sown with the coarser varieties.

Oryzopsis cuspidata (bunch grass)—This is one of the bunch grasses found in the eastern part of the state. It thrives in a sandy soil where many of the more valuable grasses would not succeed.

Glyceria furnishes several species found

—Photo by E. C. Blackwood, Portland.

YAQUINA HEAD, YAQUINA BAY, NEWPORT.

OREGON'S DAIRY INDUSTRY.

Value of Last Year's Product and Equipment Approximates $10,000,000. By W. W. Baker.

It is understood that exact data as to dairy values here, or anywhere else, is not expected to be correct to the pound of butter or cheese. No time has been spared in gathering interesting figures. I am under obligations to George L. Bickel, dealer in creamery and dairy machinery; Everding & Farrell, Page & Son, W. B. Glafke & Co., and the La Grande Creamery Company, dealers in dairy products, for many of the facts in this article.

It is estimated that we consume annually about 26 pounds of butter per capita. In addition to this, our best informed dealers estimate that Oregon has, during the present year, shipped out of the state about 900,000 pounds, and that we have bought from other states about 200,000. After much inquiry and very satisfactory estimates, I am satisfied that that there is an increase of at least 5 per cent in yield of butter produced on farms for home consumption. (This brings to mind that most people reason that all the butter and cheese consumed within our borders is the product of creameries and factories, when the fact is that as much as half of the butter and cheese consumed is made in homes that do not sell a pound), and that there is fully 25 per cent of an increase in creamery and factory supply. This will bring the butter supply of Oregon for the year 1900 up to 13,199,101 pounds, an increase of 2,199,850 pounds over last year.

In this connection, it is not out of place to remind the reader that if we have an increase of dairy products it necessitates an increase of dairy lands, dairy stock, as well as of dairy implements and labor. I have, therefore, added this increase to the tables of values that appear further on.

Oregon Butter Product by Counties.

The following table, while it is not claimed to be correct to an ounce or pound, has been made with care:

County.	Pounds.
Benton	165,000
Baker	205,000
Clackamas	225,000
Clatsop	201,625
Coos	711,938
Columbia	383,000
Crook	74,249
Curry	495,000
Douglas	378,125
Gilliam	52,500
Grant	140,224
Harney	50,549
Jackson	330,300
Josephine	13,200
Klamath	198,000
Lake	600,000
Lincoln	76,500
Malheur	797,200
Linn	330,000
Marion	600,000
Morrow	123,000
Multnomah	412,500
Polk	300,300
Sherman	115,500
Tillamook	1,764,440
Umatilla	412,500
Union	328,350
Wallowa	60,006
Washington	990,000
Yamhill	330,000
Total pounds of butter made	13,199,101
Total pounds of butter imported	20,000
Total supply	13,219,101
Total consumed	11,700,000
Total shipped out of state	800,000—12,500,000
Presumably now in the state	719,101