erally less in the Willamette valley. In the foothills of the Coast and Cascade ranges, in Western Oregon, and throughout Eastern Oregon, there are large areas which may be filed upon for government patent. The original cost is nothing.

WEALTH IN THE FORESTS.

The Great Value of Douglas Fir and of Red Cedar.

LUMBERING in Oregon is a leading industry. The timber resources of the state are more extensive and more valuable than those of any other state in the Union, except Washington. One-fourth its entire area is covered with immense forests, many of whose trees rise to heights of 300 and 350 feet. A circumference of 30 feet at the base is common. A competent authority has estimated that the forests of the state contain 265,000,000,000 feet of timber—an aggregate absolutely inconceivable to any human mind. The timber of the state has hardly been touched, and it is not likely that the present numerous saw mills will in the present generation make appreciable headway toward depletion. The varieties of timber found in the state are red fir, yellow fir, white fir, sugar pine, yellow pine, white pine, bull pine, black pine, pure pitch pine, Alaska pine, spruce, cedar, larch, tamarack, juniper, birch, oak, yew, cottonwood, ash, maple, alder, willow, elm, mountain mahogany, myrtle, dogwood, white cedar, chincapin, balm and cherry. On the eastern side of the Cascade mountains pine predominates, while on the western side fir is the leading wood.

The chief commercial woods of Oregon are the red, yellow and white fir, and the red cedar. For certain purposes fir has no equal. Masts made of "Oregon pine" (fir) have a world-wide reputation and are used in all parts of the world. For bridgebuilding, and for all other purposes where large, long and comparatively light timbers are desirable, it is superior to all other varieties. The Douglas fir of Oregon has the strength of oak, with nearly the lightness of cedar. It is straight, durable, and free from knots. No single wood can be put to so many uses and so fully answer all requirements. A recent test of the breaking pressure of fir, Eastern oak and Eastern pine, the pieces of wood having been four feet long and 2x4 inches in dimensions, made the following showing: To break the fir required a test of 4320 pounds; Eastern oak, 2428 pounds; and Eastern pine, 1610 pounds. A stick of red fir, an inch square, resisted 2000 pounds, while other woods broke at 1500 and 1600 pounds pressure.

The mountains of Western Oregon are covered with fir forests. The stumpage will yield on an average from 50,000 to 200,000 feet per acre. The trees for miles grow so thickly as almost to defy penetration. The red fir is found growing in greatest abundance at altitudes of less than 600 feet. It often measures 200 to 250 feet in height. The fiber is very hard and uniform, with an equal growth all around the tree. The timber is vastly superior to all others for bridgebuilding purposes. The yellow fir is found in higher altitudes. It is softer than the red, but its lasting qualities, when exposed to weather, are better. It is superior for flooring and finishing timber. It is admirably adapted to building purposes and interior finishing work. The white fir is less valuable than the others. It is not found in large quantities. It is used principally for piling. Red cedar has no equal for shingles.

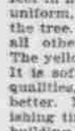
Oregon's timber exhibit at the world's fair was entered as a whole in competition as an instructive, collective, comprehensive and commercial exhibit of woods in their native and manufactured state. This exhibit secured the first medal in the forestry department. Another important award made on the Oregon exhibit was for manufacturing paper from spruce pulp. Two large paper mills are in operation in the state, and their output is very large and of very fine quality.

The saw-mill industry in the state has been comparatively well developed. The great number of streams coursing the timber belt makes the forests easily available and offers sites for mills immediately adjacent to their log supply. There is a number of large merchant mills in the state, which saw for the foreign and coast trade. There are six or seven of these mills on the Lower Columbia, five or six on Coos bay, and two on the Umpqua river, and several at Tillamook bay. The general commercial depression has been felt in the lumber trade, and has had the effect of curtailing the output for export. But conditions now seem to be improving, and the industry is assuming its former activity. Mills in Portland and vicinity until recently found a market in Denver, Salt Lake City, Omaha, and as far as Chicago. But railroad complications had the effect of shutting off cheap transportation, and shipments were interrupted. It is now announced, however, that a low rate has again been made, and the effect will doubtless be to stimulate greatly the lumber trade.

The saw mill is found in every city and town, and in all the important timber centers of the state. It is stated that there is about $15,000,000 invested in the 269 saw mills, 40 shingle mills, and 52 woodworking establishments of Oregon. The average annual output is 500,000,000 feet of lumber, 200,000,000 laths and 100,000,000 shingles.

STREAMS ABOUND IN FISH.

The Salmon of the Columbia—Trout in Mountain Waters.



FISHING in Oregon waters has for a great many years been a leading industry. The various rivers and ocean inlets of the state abound in food fishes, and the mountain streams, alive with finny denizens, are an irresistible attraction to the sportsman. The chief commercial fish is the salmon, and on the Columbia river, where salmon-canning had its birth, it ranks high as a wealth-producing pursuit. Thousands of persons are engaged in salmon-catching and packing. It is the chief source of income to all residents along the Columbia. The Royal Chinook salmon of the Columbia is known the world over as a most delectable article of food, and easily brings a higher price than similar products from any other place. Salmon are taken in seines, gillnets and traps. The latter is a device by which the fish, bound up-stream in the rivers, are led in to an enclosure, at the end of which a large wheel, with buckets, is in motion, driven by the current. The fish once in the buckets, are lifted by the wheel and deposited on a scow, or other high and dry place. It is the habit of the salmon to migrate at certain seasons in schools from salt to fresh water, where they seek spawning grounds. It is while in transit that they are caught in greatest abundance. Indeed, they have been taken from the Columbia in such enormous numbers that the supply each year is becoming less, and in consequence the annual output has fallen off from 629,000 cases in 1883 to 482,000 in 1894. Various measures have been devised for replenishing the stock, and to that end the government has established a hatchery on the Clackamas river, a tributary of the Willamette, which is engaged in artificial propagation. The state of Washington has provided for the location of another hatchery on the headwaters of the Columbia, and it is likely that the government will likewise assist further in the effort to maintain the supply. The dimensions which the salmon industry has attained in Oregon will be understood when it is stated that on the Columbia river about 600 fishermen and factory hands are employed, and a capital of $2,500,000 is engaged. Besides, there are canneries at Alsea bay, Nestucca bay, Coos bay, and Tillamook. It should be added that fresh salmon is largely consumed both at home and abroad. Oregon ships annually to the East upwards of 1,000,000 pounds. The habits of the salmon are a most interesting study, and there are phases of their methods of migration, spawning and metamorphosis that defy explanation by the pisciculturist.

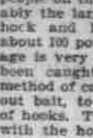
The capture and preparation for market of sturgeon engage the work of many people on the Columbia river. It is probably the largest known fish caught with hook and line. Its average weight is about 100 pounds, and at times this average is very greatly exceeded. Fish have been caught weighing 800 pounds. The method of capture is to lower a line without bait, to which is attched a number of hooks. The sturgeon comes in contact with the hooks, which, in his efforts to escape, become further imbedded in his flesh, and he is hauled from the water. The flesh of the sturgeon may be likened unto halibut. It is palatable and nutritious.

The ocean waters off the Oregon coast are inhabited by an abundance of deep-sea fish; and the mountain streams abound in trout and other game fish, that are a source of unfailing delight to the fisherman. Smelt and shad are captured in the Columbia in large numbers, and, in season, are a common article in local markets. The cod is by some considered superior even to salmon. Rockfish, deep-sea perch and other varieties are abundant. Oysters, clams, shrimps and crabs are very numerous in the bays of the ocean.

Complete details of the fishing business in Oregon are likely to be interesting only to those who have or desire to obtain special knowledge of the subject; therefore, space that might be devoted to this important topic is abridged. The ordinary inquirer, however, will be interested in knowing that all streams in the state contribute in some measure to the supply of food fishes, and every person who is able to muster hook, line and suitable bait, can readily secure his share. Mountain streams are alive with game trout and fall easy prey to the sportsman. There is no sport more interesting than salmon-trolling. And even catching crabs offers amusement as well as excitement to the thousands of sojourners at seaside resorts during the summer.

GOLD IN THE HILLS.

Two Very Rich Mining Regions—Other Important Minerals.



MINING in Oregon has assumed great activity during the past two years. The deposits are generally gold, and, following the depression of silver, prospectors have fairly covered the hills in the mineral regions, and the industry has been given vast impetus. The past two years have been notable, too, in the introduction of more exact and scientific processes in mining operations, and in the profitable and successful development of quartz ledges rather than placers. The Oregon mining districts of special activity are in the Rogue river valley and adjacent hills, and in the Blue mountain region, in the counties of Baker, Grant and Union, in Eastern Oregon. The conspicuous feature of the quartz veins of both districts is that their ores are generally free-milling. In most of the rich gold mines of Eastern Oregon the veins are true fissures, and the ore bodies are continuous. It was the remarkably rich ore found in the gold free-milling veins of Baker county that caused the first development of the quartz ledges of the Baker City mines, and while sulphurets and other base gold ores have been uncovered as depth in these old free-milling mines is attained, there are still today in this district large numbers of prospects partially developed where the gold is extracted without the aid of concentrators or smelters.

The history of all mining sections dates from the discovery of gold-dust or nuggets in the beds of some of the local streams. Gold is usually found in the beds of streams for the reason that it is in the sands or gravel of running bodies of water that mining men most naturally look for gold. While the first discoveries are made in the beds of running streams, the rich placer mines subsequently uncovered in the district are often located in the bed of some prehistoric river, the waters of which have long since been diverted to other channels. The difficulty of working claims in the bed of a live stream of water is the trouble always experienced in regulating the flow which is necessary to allow the miner to dig down in the bed of the stream to bedrock. Gold being heavier than the other deposits with which it is always associated, by the law of specific gravity alone undergoes a constant shifting process through gravel or sand, until it finally reaches a solid stratum of rock. It is this stratum which forms the bedrock of all streams in which gold is found, and it is the difficulty of reaching this bedrock which has prevented the working of what are known to be some of the richest gold deposits in America. In the Pritchard creek placers in the Coeur d'Alene mining district are deposits of gold of fabulous wealth. Although vast sums of money have already been expended in the attempt to work these deposits successfully, the principal gold placer mines of that district today are "pockets," which claim the attention of a handful of men, where the mining district would give employment to hundreds of laborers could the solution of the problem of reaching the bedrock deposits here be made a practical issue.

The greatest discoveries of placer gold in Eastern Oregon have been made in the prehistoric river bed now known as the old river channel. This can be distinctly traced for a distance of 80 miles, and along its course have been found nuggets weighing from a fraction of an ounce up to over 170 ounces. The most notable of these nuggets reached a value of $500, $800, $1500, $2100, $2400 and $3200 respectively. This last was taken out of Gimlet gulch in 1870 by J. W. Virtue, the veteran mining man of the Baker City district.

Following the placer-working period of a mining section comes the active search for quartz ledges. Working up the streams in which the placer deposits are found, the miner constantly has his eyes open for the "mother lode," from which this placer gold has been washed. The gold which is found in the beds of streams has been washed from quartz ledges a mile or two, or possibly hundreds of miles distant. At some point along the course of the stream the watchful glance of the miner discovers the "float," which indicates to him that he has not far to look for gold quartz. The development of these quartz ledges, however, requires the aid of capital and a higher degree of skill than was necessary to wash out placer gold; and it is this feature of working gold quartz that gives to quartz-mining its stability as a legitimate business enterprise, while placer-mining, on the small scale in which it is usually handled, is the unsettled calling of the typical miner in which the gambling inclination is the principal incentive for the necessary affort required to work the claim.

The great mining district of Eastern Oregon is covered by the tributaries of the John Day, Grand Ronde, Powder, Burnt and Malheur rivers. This belt is included within an area of about 130 miles in length by about 90 miles in width. The early placers of the Canyon City mines were located within this belt, as were all the subsequent rich finds in that part of the state east of the Cascades. In the period of 40 years since the first discovery of gold in Baker and Union counties, it is estimated that these placers have yielded no less than $20,000,000 in gold. The placers of Willow creek, although less limited in extent, have made equally as satisfactory a showing. The Rye valley placer mine, in this district, has yielded, since 1882, an average annual output of 1400 ounces of gold.

The most famous free-milling gold mine in Oregon today is the Virtue, located within a few miles of Baker City. This mine was first opened over 20 years ago, and, with the exception of short periods of inactivity, it has been constantly worked since that time. It is estimated that the yield of this single mine has been no less than $2,000,000. The White Swan, another rich mine of this district, yielded $82,735 during the past year, while the Bonanza, a close second, produced for its owners during the same time $60,576 40.

Baker City is today the leading mining center of the rich gold and silver deposits of Eastern Oregon. The districts of Pine Creek and other rich mining centers tributary to Baker City have been so frequently written up, that any detailed account of these mines is not called for in the present instance. It can be stated, however, that in the Pine Creek district today are some of the most complete mining plants on the coast, and mining in the entire district tributary to Baker has reached the important stage of being termed one of the principal industries of Eastern Oregon. It is estimated that the output of the mines of Baker and Union counties alone during 1894 yielded no less than $1,400,000, a gain of about $200,000 over the value of the output of these mines during the previous year. This output was principally in gold, as the low prevailing price of silver during the past two years has prevented the working of the silver deposits of Eastern Oregon at a profit to the mine-owner.

An important mining camp is the Cracker Creek district, about 35 miles long. The chief mines are the North Pole, the Eureka and the Excelsior and Columbia. This district at one time attracted great attention, but the ore was in places so rebellious as to make profitable reduction exceedingly difficult. It is now believed that the whole problem has been solved by the introduction of the cyanide lixiviation process. It appears to have answered every requirement, and a renewal of former activity is confidently looked for.

The Cable Cove district is four miles west of Cracker Creek, and is in a stratified granite formation. The mineral belt is four miles in length by three in width. Throughout the district ores average from $15 to $20 per ton, the veins being 12 inches to 18 feet wide. The district is in course of development, and has an exceedingly promising future.

There is activity also in the Granite district, 40 miles back in the mountains from Baker City. New capital has been interested, and profitable results are anticipated.

Union county is the scene of much development in mines, and it rivals Baker in the volume of its output. Important districts are the mines at Sparta, chief of which is the Sanger group, with an average annual output of $250,000. Corcupcia, Eagle Valley, Telocaset and Pine Creek. The Dolly Varden and Little Pillsbury are leading mines at Sparta.

The Southern Oregon mines have recently equaled the mines of Eastern Oregon in extent of development work and degree of attention shown by practical mining men. Gold is found in all the numerous streams of Southern Oregon, and placer and hydraulic mining have for years been generally engaged in. It is only in very recent years that vein-mining on a commercial scale, with improved modern appliances, has been attempted. In past times very valuable "pockets" had been discovered in Jackson and Josephine counties, but these were speedily exhausted, and were probably responsible for a conviction long prevalent that the veins were not true-fissure. This theory, it has been satisfactorily demonstrated, was wholly incorrect. Permanent ledges have recently been uncovered, and are now being profitably worked. Two practical miners from Colorado, in prospecting in the neighborhood of Ashland during October, 1853, struck what they believed to be a true-fissure vein. This was within one mile of Ashland and on the direct line of the Southern Pacific. They quietly proceeded to open up their vein. Their first shipment of ore to the smelter at San Francisco netted them $270 a ton, and ore has since been taken out of this vein which assayed as high as $518 to the ton. Many other fine prospects in Josephine and Jackson counties are now being worked to advantage. The output of the Ashland mine now amounts to about $50,000 annually, and the company's five-stamp mill is working on low-grade ore averaging about $20 per ton, and is being worked at a profit. This ore is merely the product of the development work now being done in the tunnel, and it is reasonable to expect that ore carrying far more gold will be uncovered as greater depth is attained. The Sterling mine near Jacksonville has yielded about $100,000 in the past.

The success of these mines has immensely stimulated interest in the industry in Southern Oregon. The entire foothill region in that district is mineralized, and prospectors are very numerous. Strikes are frequently reported.

An important producing mine is the Annie Consolidated, in Lane county. In Linn county, the Albany Mining & Milling Company has recently sold a group of claims of approved value to a foreign corporation, and they will be worked on a large scale.

Ocean beach mining is profitable in Coos and Curry county. Gold has been carried by streams to the beaches of the ocean, and there the black sands are worked with success.

On the whole, the gold mines of Oregon have a future exceedingly bright. The recent great stimulus it has received will doubtless have permanent beneficial results. There is no field of operations which now offers more secure inducement to capital, and it cannot be doubted that the opportunity will be taken full advantage of. The outlook is that Oregon's gold output for 1894 will exceed $2,000,000.

IRON.

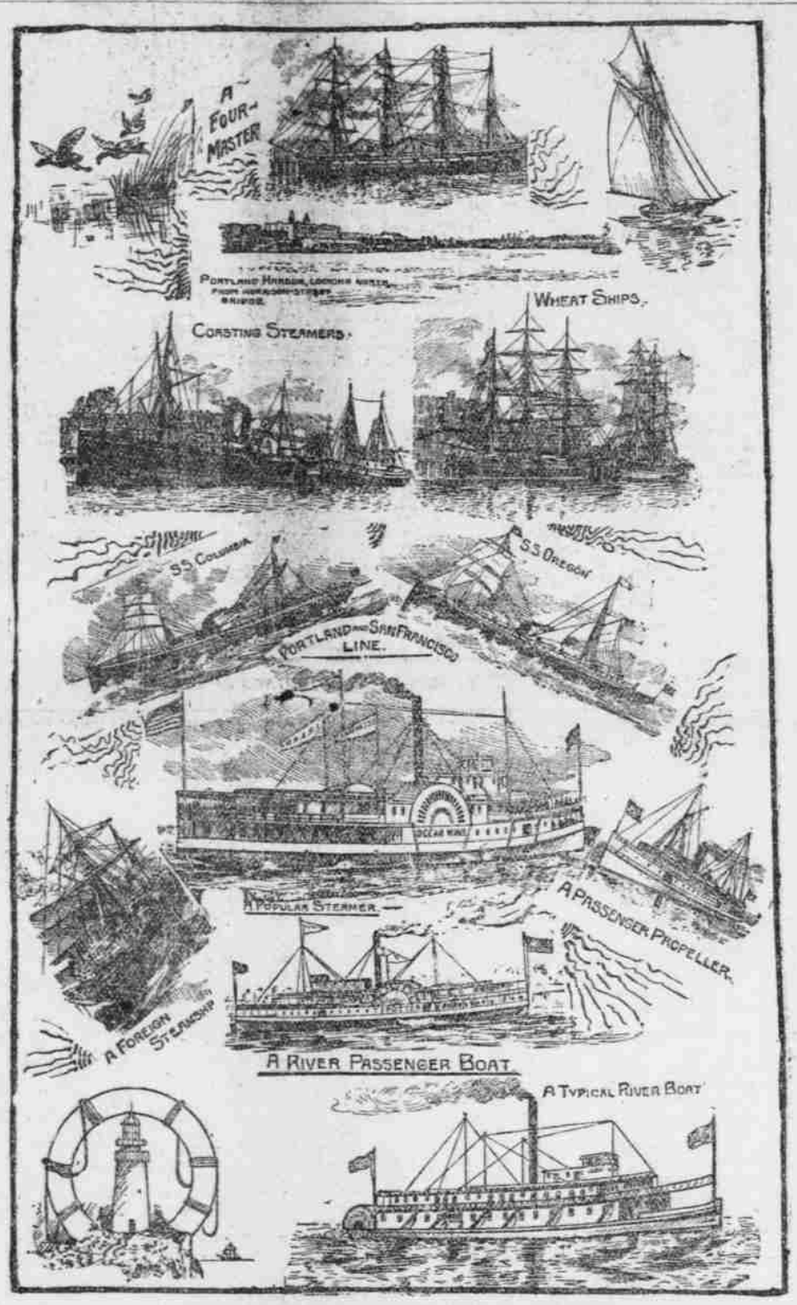
Near Oswego, on the Willamette river, seven miles from Portland, the Oswego Iron Company has for a great many years successfully developed a deposit of iron in the Scappoose hills. The product of pig-iron has been sold in Portland and San Francisco. Owing to the tariff and other causes, not necessary to review, the furnace is not in operation; but it is hoped conditions will allow resumption of work. The iron ore found in the Scappoose hills is hydrated oxide of iron, or brown hematite. The lava rocks of Oregon are also said to be rich in iron.

COAL.

Several extensive coal mines are in operation in Coos county. The output finds its principal market in San Francisco. One company, it is said, has capital invested in a $2,000,000 plant, and Coos bay coal is a fair rival to the mines of Washington. The principal deposits in Oregon lie in the stratified rocks of the coast range. It is a low-grade lignite. At various places in the state veins have been discovered, and give promise of abundant returns, if worked. At Willhoit Springs, Clackamas county, in Nehalem valley, near St. Helen's, and in the John Day valley, Eastern Oregon, deposits are located.

OTHER METALS.

Other useful minerals are found in Oregon. Copper has been discovered in large quantities in Josephine county, and an attempt has been made to mine it. In Douglas county, near Riddle, are vast deposits of nickel. It has been demonstrated satisfactorily that these deposits are workable, and have great commercial value. Lead is found in Wallowa county, and in other localities. Manganese is very abundant in Columbia county, and has been exported in quantity. Cinnabar deposits are located 14 miles northeast of Oakland, Douglas county. Marble and granite are located in accessible beds. Limestone, olive brownstone, gypsum, kaolin, pottery clays, cement and mica abound. There are a number of important quarries of building stone.



TYPES OF VESSELS SEEN IN PORTLAND'S HARBOR.

WOOL AND STOCK.

Great Development of These Industries in Eastern Oregon.

WOOLGROWING and stockraising generally have reached the very highest development in Eastern Oregon, and have assumed no small importance in the district west of the Cascades. The vast bunchgrass plains east of the mountains afford very fine opportunity for stockraising of all kinds, and cattle, horses and sheep are to be found by thousands in every part of the great region. Eastern Oregon might be fitly termed one immense stock range, though it is not to be understood that the country is entirely surrendered to that pursuit. As a matter of fact, the plow is year by year confining the extent of the range to more limited areas; but the farmer and the stockman thoroughly understand that their interests are mutual, and there is little or no friction between them. Stockraising throughout the state is commonly associated with agriculture, but it is likewise extensively engaged in as an exclusive pursuit.

The chief aid to the stockraiser is the native bunchgrass, which grows so abundantly that Eastern Oregon is often known colloquially as the "bunchgrass country." It takes the place of ordinary pasture and of grain or hay. It contains all the elements of nutriment necessary to the development of bone, muscle and flesh. Bunchgrass horses are uniformly swift and hardy. Besides the bunchgrass, ryegrass grows on lowlands and hillsides; but stock prefer the larger growth and neglect the rye. It has been demonstrated, however, that when the bunchgrass is trampled out, other native growths take its place, and now support stock just as satisfactorily as ever.

The conditions of climate in Eastern Oregon are extremely favorable to stockraising. The winters are seldom severe, and stock requires no shelter except the open sky. It is true that there is occasional loss through protracted cold and snow, but it is exceptional. Herds of cattle have been known to graze in one place for 15 years continuously, and to have nothing but natural food; and there was but little loss from any cause. As a rule the animals are in excellent condition in the spring. There is but little rain in the summer, and water is abundant in running streams and living springs.

Very great profits have been made from the sheep and wool industry in past years. Oregon is in the front rank of woolproducing states. The annual average clip is 18,000,000 pounds. For 1894 the output in Eastern Oregon was 18,000,000 pounds; Willamette valley, 900,000 pounds; Umpqua valley, 225,000 pounds. Tariff legislation has recently affected the industry unfavorably, but the prospect is that better prices will prevail. The general engagement in woolgrowing in Oregon has resulted in the development of related industries. Woolen mills are common throughout the state. Looms are in continuous operation at Oregon City, Salem, Albany, Brownsville and other places. There is a large woolscouring plant at Pendleton. About one-half the Oregon output is consumed at home. The number of sheep in Oregon in 1894 was 2,529,750. California, which has more than any other state, had 3,818,157. The annual mutton sales of Oregon are very large, aggregating more than 300,000 head.

The large pursuit of cattle-raising in the state has had the effect of improving the strains by the introduction of fine blood. There are many breeders of superior stock. There is much excellent dairy stock, though dairying has by no means assumed the importance it deserves. No essential to successful dairying is lacking in Oregon, and in some important respects its advantages are superior. In Eastern states the most scrupulous economy is practiced in order to make the pursuit a success. In Oregon ordinary care and intelligence applied to dairying bring even more profitable returns. The even climate and abundant growth of nutritious grasses are very great advantages. Dairying has assumed importance in the Willamette valley, along bottom lands, and particularly on coast points. It has perhaps reached more complete development in Tillamook county than elsewhere. In that coast county there is a combination of climate, pasturage, cool nights and clear water, all admirably adapted to the purposes of dairying. At other places in the state there are well-equipped dairies. There is an excellent local market in Portland and at other Oregon towns.

In this connection it may be mentioned that poultry-raising in Oregon is ordinarily profitable. It can be advantageously combined with horticulture, agriculture, dairying or stockraising; or it may be followed as a single pursuit. The average price for eggs the year around is from 15 to 25 cents per dozen. Chickens will usually bring 40 cents each, and more.

Much attention has been paid in Oregon during the past year to the raising of hogs. Every element necessary to their successful production is present. Wheat has been fed to hogs during the year with most satisfactory returns. A current news item is that a farmer brought into Salem the other day three dressed porkers for which he received $41 cash. Others are doing as well. Special inducements for hograising in the state are cheap food, freedom from disease, and good cash markets.

The raising of horses in Oregon has ranked in importance with the sheep and cattle industries; but it has recently not been so profitable. The same conditions which have been of advantage to sheep and to cattle have applied with equal force to the horse. He thrives just as well as a sheep on bunchgrass, and he requires almost as little attention. But, for reasons not necessary to review, the demand for common horses during the past few years has notably decreased. Much money has been invested in fine imported stock. There is always a good market for a fine horse, and Oregon excels in producing high-class animals. This branch of the industry has not suffered seriously.

The Study of Diet.

Germany is doing a great work in its study of and experiment in dietetic matters. It has now established a school or class of experiment among its soldiers. This class is composed mostly of volunteers. A special diet is given to each man, and his temperature, weight, perspiration, energy and fatigue are carefully recorded. Such comparative study cannot fail to be of the utmost importance. It is intelligence which the human race sorely needs. Conventional usage has made us slaves to most absurd and harmful practices in eating. We are creatures of habit in the matter of food, as in much else. Unhappily, most of the habits are wrong. We would be amazed at the injury we do ourselves daily if we could know it. We live, the most of us, on indigestible food, which not only does not build tissue but aids in destroying it.