GLEANER, DELVER AND HEWER.

Handicraft of Rustic and Urban California.

MINING WITH PICK AND PAN.

California's industries have grown beyond the booming and writing-up stage. Our horticulture, for instance, needs no pen nor press to tell of its wonderful progress. It is patent to the world. All that is attempted in the following columns is a series of rough outlines of what has been achieved, giving only a short space to each of a few of the leading industries.

The illustrations are not meant as actual scenes in orchard, field or mine. They merely typify the industries for which they stand and only give a glimpse of their actualities.

FRUITS OF THE LAND.

California is to-day the greatest fruit-producing State in America, or in the world, and its future will equal in greatness the capacity of human intelligence for expansion.

California fruit cannot be excelled, and while it has the East for a market it also has the world for a market; but these markets must be sought. Already fruit has been transported to England in good shape, and it is believed that shipments to distant points will yearly become a more important business.

For many years fruit-growing in California was largely experimental. While early in the fifties there were numbers of small orchards, it cannot be claimed that the fruit industry existed as a business until twenty years afterward. The orchards were as a rule accessory to more important pursuits—not the principal pursuit they are to-day; and it was not until 1870 that fruit-growing in California became established as an independent business.

The competition of the railroad to the Eastern States assisted its growth. For, while there was little fruit shipped East for several years after the completion of the road, a demand for California fruit sprang up along its line and gave an impetus to the new industry.

The demand has since that time continually increased and spread, until to-day the orchard industry of our State leads all others, and California ranks first among the fruit States of the Union.

The industry is a rapidly growing one, too, and the next five years will see the output of the State doubled. Our fruits to-day, in various shapes—green, dried, canned, preserved and manufactured into jellies, raisins, wines and brandies—are shipped to every corner of the world.

There were shipped by sea in 1891, 15,223,440 pounds of fruit. By rail in the same year, by Santa Fe and Southern Pacific systems: Fresh fruit, 98,680,100; dried fruit, 65,090,220; raisins, 44,954,850; canned fruit, 49,566,680 pounds.

The future importance of the industry can be estimated by its growth in the past. In twenty years our shipments have grown from nothing to 20,706 carloads in 1891. At the present time not over 25 per cent of the orchards planted are in bearing and not over 5 per cent have reached their maximum.

Taking round figures and placing the output at the lowest figure the conclusions reached are startling. We have now in the State at least 200,000 acres in orchard. This will all be in bearing in five years and allowing 100 pounds to the tree—a small estimate—we get the following figures:

Acreage now planted	200,000
100 trees per acre	20,000,000
100 pounds to the tree	2,000,000,000
Tons	1,000,000
Carloads	100,000

The advantages of California for raising fruit are its topography, its early season for maturing fruits, the quality of its fruit and its climatic advantages for gathering and handling fruit.

A very large portion of the entire coast range is admirably adapted to horticulture. It has been found that the fruit grown upon the foothills and mountaintops is superior in flavor and often in size to that grown in the valleys. Through all this region the apple, the pear, the plum, the prune, the cherry, the olive and the fig are grown in great luxuriance. Except upon the very summits, where the ocean winds in blossoming time may interfere, the apricot, the nectarine and the peach find a congenial home, while the grape does almost equally well in all parts of the State.

Toward the south the orange, the lemon, the lime, and even the banana are successfully grown, while the nut-bearing trees thrive wherever they have been planted throughout the entire extent. Nowhere in the valley or the western hills—not until the Upper Sierra is reached—is it ever cold enough to kill peach or apricot trees. The orange and other citrus fruits thrive as far north as Butte County, and are grown in protected places, even in Tehama and Shasta.

The two conditions of soil and climate are in accord to mature our fruit earlier than elsewhere in the same latitudes.

The superior quality of California fruit is conceded. Well grown, well and naturally ripened fruit grown on this coast is of a better quality—making quality dependent upon texture and flavor—than that raised upon the Atlantic Coast. Our mountain apples—those from Humboldt, Lassen, Modoc, Del Norte and Siskiyou Counties—are not to be excelled.

The advantages of California in the line of grape culture are even more marked. The fact that raisins can be and are cured in the open air and among the vines makes it possible for us to produce them at a moderate cost, and the quality has already spoken for itself. The raisin industry can be extended to an almost unlimited degree, as nearly all the valley portions of the State, with the surrounding foothills, are well adapted to it. In this, as in viticulture, there is much yet to learn.

The question of irrigation has a particularly important bearing on horticulture, as the naturally watered lands become taken up. Year after year it is being proved that lands apparently valueless can by this means be made to yield as much as and more than land naturally watered. This is shown in the fact that the growth of California in the past decade has been wholly in the irrigated counties. In 1886 the reclaimed area was 5,500,000 acres; in 1890 it was 15,112,106; in 1891 it was 18,533,107, and with the completion of the works now under construction this will soon be increased to 25,000,000 acres which can be irrigated and made of use to the horticulturist.

Among the fruits, nuts, etc., which can be grown to perfection in California are: Apple, pear, peach, nectarine, apricot, plum, cherry, olive, fig, grape, orange, lemon, citron, lime, pomegranate, quince, pistachio, tamarind, carob, persimmon, pineapple, white sapota, banana, guava, loquat, date, jujube, walnut, pecan, peanut, chestnut, hazelnuts, filberts, almonds, raspberry, blackberry, currant, gooseberry, strawberry, mulberry, cranberry, cherrimoyer or custard apple, alligator pear, granadilla, medlar, melon shrub, chayota or chocho, tomato, cape gooseberry, bamboo cane, tuna, Spanish bayonet, pampas grass, New Zealand flax, sugar cane, fennel, camphor, broom corn, Indian millet, sunflower, rape, licorice, nutmeg, coffee, tea, rice.

SOWER AND GLEANER.

Agriculture, by which term is signified here general farming of the land, has no more favorable scene for its operations than California.

This applies specially to the production of cereals, grasses for hay and pasture-flax, beets, hops, vegetables, dairy products, wool, besides fruit and grapes, which are here treated of individually.

California is, perhaps, the best country in the world, excepting Australia, for the raising of sheep. Nowhere do they so thrive and multiply with so little care, and no fleeces of similar breeds are so heavy. There are about 6,000,000 sheep now in the State. Seventy-five cents each would be a high average for pasturage, herding and shearing. Probably $1 each would not be far from the net receipts for wool. As ordinary range sheep are worth $2 to $5 per head, and at least one-fourth the flock can be turned off as mutton sheep every year and still have a balance of net gain from the increase, it can readily be seen that the sheep business is on a good basis in California.

In the culture of cereals the climate of California is ideal. The seeding of summer fallow begins in the principal wheat section in September, and the last winter sowing is generally done in February. Plowing for summer fallow occupies the next three months, and harvest begins in June. The last of the grain sacks have generally been hauled from the field in October. This makes it possible to seed and harvest as many more acres with the same men and teams as the season is longer. Improved machinery adequately meets any scarcity or cost of labor, and yields and prices make the growing of cereals steadily remunerative.

Arable land in California has been thus divided: San Joaquin Valley, 6,845,280 acres; Sacramento Valley, 5,598,720 acres; lands between alluvial lands of great valleys and elevation of 2000 feet, 6,000,000 acres; lands between elevations of 2000 and 4000 feet, 7,000,000 acres; Santa Barbara, Los Angeles and San Diego, 3,000,000 acres; coast valleys—Salinas, Napa, Russian River and Santa Clara, 5,000,000 acres. Total, 33,444,000 acres, about one-tenth of which is annually devoted to wheat.

Some $3,000,000 or $4,000,000 worth of corn gets into the annual statistics through the channels of trade. In some of the counties it is raised as a second crop after wheat or hay or early potatoes. Crops are about the same as in the great corn States and prices average nearly three times as much.

Flax, cotton and tobacco could all be grown largely here, but so far have not attracted much notice. A flaxmill in East Oakland runs on flax imported from Ireland and Canada.

The raising of beet sugar has been carried through the experimental stage and finally become firmly established at Alvarado, Watsonville and Chino. It is claimed that our climate produces 3 per cent more sugar than the European and permits planting and harvesting for a season four times longer, and that its effect upon the following wheat crop is to increase it 30 per cent.

The State is rich in grasses, specially in alfalfa, which in view of the fact that a great part of all we wear and eat comes from the domestic animals, has been regarded as the most valuable of all our plants. It was introduced into Chile in the early days by Governor Bigler and has been called Chile clover. All clovers root deeply, but this one sends its roots down twenty feet. This accounts in part for its marvelous crops which average two tons to the acre and these follow one and another during warm weather at intervals of about six weeks, provided each crop is irrigated. A very large share of the hay sold in market is of this kind and a great many make a business of baling it for the city markets. It would be nothing strange to see a pair of horses, half a dozen cows, a score of hogs and a hundred hens getting the most of the living from two pastures of three acres each.

Hops are a paying crop in California, and jute is successfully grown in Merced, Stanislaus and San Bernardino counties.

The annual bean crop of California is enough to load a train thirty miles long. Almost all these are raised in the two counties of Santa Barbara and Ventura.

Market gardens or truck farms abound

A THRESHING SCENE.

throughout the State. There are 4965 men employed on such farms on the Pacific Coast at average wages of $1 35 per day. For many years a great business has been done in melons in the warm, sandy loam of the San Joaquin Valley, and the people of the Lodi district have made themselves famous for the quality and quantity of melons produced.

More than has yet been done in supplying the East with winter vegetables and fruit remains for the future. Silk is also an industry of the future, California now using an amount of silk that would require 20,000 people to produce. The only objection so far is the competition of cheap labor in other countries, for the State has every natural condition favoring the production of the staple in large quantities.

Flowers, for trade in seeds as well as essential oils for perfume, find a natural home in California, as do a large number of trees for ornamental, shade and wind-break purposes.

In livestock, besides racing horses, the climatic and topographical conditions are highly favorable to draught and saddle horses, mules, cattle, swine, goats and poultry.

Take the State over and there will be found about one mule to every nine horses.

The cattle chiefly in use for dairy purposes are the Jerseys, Guernseys, Ayrshire, Devon, Holstein, Durham, Hereford, Angus, Aberdeen, Galloways and Norfolks. During the past ten years cattle in California have not increased, but we have 500,000 more people to consume them.

Forty-four per cent of the hog product consumed in California comes from the Mississippi Valley. Still many hogs are raised here, the Berkshire taking the lead, with the Poland China second.

Little has been said in the foregoing as to the necessity of irrigation in certain districts, but this is a question which cannot be treated generally. A large number of the departments of general farming require no irrigation in the State, although alfalfa, other grasses, garden truck, etc., are always improved by water wisely supplied.

JUICE OF THE GRAPE.

If there is one vegetable growth that more than any other finds a congenial home over hill and dale and high mountain ranges in California, and which nearly every one plants, it is the grapevine.

The area of land in California already devoted to the viticultural industry is not far from 200,000 acres. In importance the industry is constantly growing, and the acreage is steadily increasing.

The superior flavor of mountain wines is tending unmistakably to transfer the culture to the cheap and ample ranges in which the gold mines are situated.

There are said to be three distinct wine districts in California. First, the southern, or Los and white wines of much spirit and little aroma; second, the Coast Range, including Sonoma, Napa, etc., making white and red acid wines—hock, sauterne, claret, etc.; third, the foothills of the Sierra Nevadas, in the goldmining range, including Folsom, Sonora, El Dorado, etc., making dry wines of extraordinary bouquet and aroma—sherry, Madeira, Teneriffe, etc., also port and German wines, the latter having a high aroma unlike any Rhine wine.

At the Potrero, a southern suburb of San Francisco, and bordering on the bay, are situated the Union Iron Works, which have grown to great importance during the last few years. They are considered one of the great industrial enterprises of the Pacific Coast and a representative industrial success of American energy.

A brief reference to the rise and progress of these works will be of interest.

In 1849 a steamer needed repairs in San Francisco and it was necessary to make a casting, which was something unheard of previously in the infant town. The late Peter Donahue succeeded in running one in the sands on the seashore and shortly afterward started a small foundry from which grew the present Iron Works.

His place of business was on Mission street, where he was succeeded by H. J. Booth & Co., who continued up to 1870, when the firm became Prescott, Scott & Co., who incorporated in 1882 under the style of the Union Iron Works, and in 1883 moved to their present location.

At present over 1000 men are kept constantly at work in the different departments, and the indications are that this number will be materially increased as time goes on.

The total area of floor space is 277,269 square feet and the ground floors exceed four acres. The whole establishment includes an area of twenty-three acres.

The works are the largest on the Pacific Coast and believed to be the best equipped of any in the United States. The machinery is perfect in every respect.

The shipyards, where the steel cruiser Charleston and other naval vessels were built for the United States Government, are an object of abiding interest to visitors on account of the grand mechanical appliances in operation.

A much greater proportion of small craft ranging in burden from ten up to seventy or eighty tons is built in California than of larger vessels.

The keels for a considerable number of ferryboats and steamers for navigating the inland waters of the State are laid every year in San Francisco or other places about the bay, or along the navigable streams of the interior, all this class of vessels, with a few ocean-going steamers, having been built in this country.

During the year 1889 there were 46 vessels built, against 59 in 1888. The gross tonnage was 8,544.05.

In the same year the exports by sea were of the value of $41,250,921, as against $40,825,000 and $35,964,882 of the two years previous respectively.

A large number of vessels are required for the whaling trade in the Arctic Seas and also for the canning industry on the Columbia River and elsewhere. These are very important industries on the coast and maintain a steady contingent of employes, while yielding a steady profit to their promoters. The Alaskan waters owe most of the craft there used to San Francisco capital.

The coasting trade is of steady volume, but is doubtless kept smaller than it would otherwise be by a curious sympathy with overland rates. These have of late been criticized to some point and competition from unsubsidized quarters to Panama and elsewhere is likely to impart a healthier briskness in this important industry.

Still more is hoped for trade in the shipbuilding and other lines from the completion of a trans-isthmus route at Panama, Nicaragua or elsewhere, a consummation which is believed to be an assured fact in the near future.

The total tonnage of the vessels built during 1890 was, gross, 12,063.59.

In addition to this amount the Pacific Mail steamer City of Panama was entirely rebuilt at the Union Iron Works. The British ship Kenilworth, nearly destroyed by fire in 1889 at Port Costa, was also rebuilt at the Union Iron Works, and now sails under the American flag. Considerable other work was performed during the year which was almost equivalent to the rebuilding of several steamers. The ferry steamer Ukiah, built by Dickie Bros. for the San Francisco and North Pacific Railroad, stands out most prominently in the above list, her tonnage being only exceeded by the ferry steamer Solano, plying in these waters.

But it is in the line of iron-ship building that California is now attracting a greater share of attention, and she has already achieved a brilliant record for work performed and her facilities and ability to turn out naval vessels of the largest class. In this connection it is only necessary to refer to the cruisers Charleston and San Francisco and the Monterey, and cruisers Nos. 3 and 6 yet to be completed.

DOWN IN THE MINES.

Although the fever of the first gold rush has subsided, California still produces far more gold than any other State, or all other States together, and is the leading gold-producing country of the world.

Nor is the mining interest of California dependent upon gold, for this wonderland yields alum, antimony, asbestos, asphaltum, borax, building stones, cement, chrome, coal, copper, graphite, gypsum, infusorial earth, iron, lead, lime, manganese, marble, mineral paint, mica, nitrate of soda, ocher, onyx, petroleum, platinum, pumice stone, quicksilver, salt, sulphur, tin.

The output of gold is variously estimated by different authorities as from $1,250,000,000 to $1,500,000,000. At present our annual product is about $30,000,000, and is likely to continue for many generations. To be sure, the places where gold could be dug with a case-knife or spoon have been worked over and the days of the rocker and long tom are no more. It requires capital to develop mines, and those engaged in the business are inclined to be very quiet concerning the product.

The following table of cost of working gold by various methods in practice is taken from the United States Treasury report:

Class.	Cost per ton of material treated.
Auriferous vein	$3 00 to $10 00
Drift-mining	75 to 4 00
Miners' pan	5 00 to 8 00
Rocker	2 00 to 3 00
Sluices	75 to 1 00
Hydraulic methods	1½c to 8c

The use of electricity as applied to hoisting and crushing machinery and the use of the machine drill have made wonderful changes in the cost of mining. Chemical processes have been so improved that a great deal of the treasure formerly wasted is now saved. It often pays to work over the refuse or "tailings" from old mines, and mines that did not pay by the old processes are being reopened and worked at a profit under the new system.

Hydraulic mining has been almost generally suppressed by law. By this method the water was carried by pipes from reservoirs sometimes long distances from where it was to be applied and turned against the base of a bank of earth with an irresistible force that enabled the operators to wash down whole mountains into the valleys. Such damage was caused to farms and navigable streams below that these mines have been at last closed, except where the debris is carried off by the Klamath and Trinity rivers and their tributaries. There the farming interest is so small and the streams so rapid that this method of mining is not seriously opposed.

The average number of vines to an acre is about 900, which make generally 800 gallons of wine and 20 of brandy from the residue. In France 300 gallons of wine and 4 to 5 gallons of brandy are made per acre. The predominance in Europe is acid; in California saccharine matter. In 100 pounds of California must we have 25 to 40 pounds of sugar; in Europe 15 to 20 pounds.

In California it is claimed that no doctoring is done, no flavoring, no coloring, no sweetening; but some brandy is added from the same grape to some of the sweet wines.

At first fully one-half of the California vines were in the lowlands, as it was supposed they would there stand drought best. This was found to be an error. Everywhere on the steep hills of the interior the vine grows and thrives without irrigation. Many have watered, but year by year the practice was abandoned, as not only unnecessary but positively harmful to the fine flavor of its wine. Once fairly rooted the vine stands the summer's long drought better than any other plant; but if taught to depend on artificial watering it is divested of its natural instinct, which directs it to send down its pump-root to the line of perpetual moisture.

Recent statistics gave 7000 large individual grape-growers in the State, of which 3000 or 4000 devote their grapes to wine-making.

Since 1875 up to the vintage of 1891 there has been an actual shortage in the world's wine product of about 1,000,000,000 gallons, the greatest deficit being in France, which produced in 1875 twenty-two hundred and thirteen and odd million gallons, including the product of Algeria, where viticulture has only been known for the last ten or fifteen years. Germany follows next; in 1875 her production was 171,000,000, which fell to only 13,427,091, Italy, Spain and the United States being the only wine-producing countries showing an increase.

The solution of this problem was found in two facts. The first and the smaller was the increased consumption of beer in the wine-producing countries.

Up to the beginning of the present decade beer was not drunk by the better classes of people in France or Barcelona, and statistics prove that latterly the consumption of beer in Paris is nearly twice that of wine, caused by the absence of the smaller or bourgeois wines, called petits vins, which were within the reach of the common classes. In 1891 France imported 244,000,000 gallons more than she produced, and she imported that for her own consumption. In that year Paris consumed nearly three times as much wine as the whole of the United States.

The second solution of the problem of the shortage in wine is the fact of the widespread manufacture of fictitious wines. Consular reports show that in 1889 France manufactured 5,000,000 hectolitres or nearly 130,000,000 gallons of fictitious wine, made from pomace or died grapes, Zante currants, or any other available fruit product producing alcohol. The Moniteur Vinicole, a French paper, places the production of fictitious wine in 1891-92 at nearly 140,000,000 gallons; but that does not take into consideration the fallicized adulterated wines produced in Germany and for which Hamburg is the great market.

The only cure for this state of things is thought to be the enforcement of existing pure-wine laws, and the enactment of a national pure food and liquor law.

The president of the Board of Viticulture, in his latest report, gives the following facts:

All of the vineyards set out in the great planting era of 1880 to 1885 are in bearing, and there are practically no new vineyards to come into bearing. This means that the annual yield of wine and brandy in the State cannot be materially increased for at least five years—that is, until new vineyards can be planted and brought into bearing. I do not think that the annual yield for the next five years will exceed 18,000,000 gallons of wine and 1,250,000 gallons of brandy. To consume this we have a present Eastern and foreign demand for 12,000,000 gallons of wine and 800,000 gallons of brandy and a home consumption of wine of 6,000,000 to 8,000,000 gallons and of brandy about 300,000 gallons.

This would seem to indicate a lively reaction in prices before long.

Following are the latest figures, giving the production of wine and brandy, etc.:

1890, 18,000,000 gallons; 1891, 20,000,000 gallons; 1892, 10,000,000 gallons. The decrease in 1892 was due to frosts, coulure and hot weather before the vintage. The prices paid for grapes ranged from $10 to $25 or $30 per ton, the latter for such grapes as the Cabernet, Petit Pinot, etc.

Brandy-making is a very flourishing branch of the business. In 1891 the production was 1,475,525 proof gallons. There are about 250 distilleries in the State with more springing up.

BUILDERS OF SHIPS.

The first steamer constructed on the Pacific Coast, according to the records in the office of the Registrar of the Treasury at Washington, D. C., was a small boat of 59.59 tons, built at Sonoma.

The first prominence given to shipbuilding in California was when the steamer Comanche was launched from the Yolo side of the Sacramento River on September 18, 1851.

In 1853 there were two steamers, measuring 150.50 tons, built in Sacramento, and in 1854 five steamers launched at San Francisco measuring 399.18 tons.

Between 1849 and 1860, however, the shipping employed on the Pacific Coast was almost wholly of Eastern build. The year 1860 was fruitful in the building of costly and elegant steamers for the river trade, and from that time the shipbuilding industry received quite an impetus, many craft of various descriptions being launched in the subsequent years.

There are belonging to this port 727 vessels. Of these 186 are steamers.

In 1890 there were 21 sailing-vessel liners, that is vessels making regular runs, owned by 21 companies and firms, and 21 steamship liners.

The foreign exports from the port for 1890 were $40,124,305 and the imports were $46,193,679.

The United States navy-yard on Mare Island furnishes employment to from 500 to 1200 men, and contributes largely to the general prosperity of the neighborhood. A large amount of money has been expended upon the construction of drydocks, foundries, machine-shops, etc.

The stone drydock just constructed is one of the largest in the world, and there are appliances here for the repair and construction of vessels of all kinds.

The largest ferry-boat in the world, the Solano, runs in Solano County for transportation between Vallejo and Benicia, and as high as forty-eight loaded cars and four locomotives can be carried across the straits at a single trip.

Drift mining has been substituted for hydraulic in many places, the operators, instead of removing several hundred feet of dirt by hydraulic monitors, running in a tunnel and only bringing out the few feet of pay dirt.

Two-thirds of the gold produced by California is from quartz mining. About 4000 stamps are running, and it is thought that they crush more than 2,000,000 tons of quartz annually. Under new systems of applying power quartz yielding as low as $2 per ton is profitably worked. This system is carried on in three-fourths of the counties of California.

River-bed mining is constantly being tried, the system consisting in turning the course of a river in such a way as to expose the river bed and reach the gold left in deposit as the current washed away the lighter material.

Beginning at the southern boundary of California, going north, the most productive counties in gold and silver and in the large number of which the quartz mining industry predominates, are as follows: San Diego, San Bernardino, Kern, Inyo, Fresno, Mariposa, Mono, Tuolumne, Calaveras, Amador, Sacramento, El Dorado, Placer, Nevada, Yuba, Sierra, Butte, Plumas, Shasta, Trinity and Siskiyou. In the silver producers, San Bernardino and Inyo, silver is largely in excess of their gold product, while in Mono the reverse is the case. Of the gold-producing counties Nevada leads, little Amador is second and Sierra third.

The State Mineralogist, in his latest report, surveys the mining situation with thoroughness. After speaking of the application of electricity to mining, he says:

As greater depths were attained in our quartz lodes new troubles began to develop themselves. Not only was there more lifting to be done with increment of water to be taken care of, but the ores on the line of permanent water being reached, instead of being of the free-milling variety were more or less sulphurated, necessitating the employment of other and more costly methods of treatment. Confronted by this new evil, many mill and mine owners suspended operations awaiting the result of experiments made by others. Here followed a series of years during which a great deal of money was spent in the trial of methods, mechanisms and processes designed to work these sulphurated ores with success, an end which has at last been in good measure attained.

Meantime the industry of silver mining was inaugurated in this State; but before this new industry had been fairly established the demonetization of silver taking place dealt it such a staggering blow that it has been languishing ever since; our product of that metal being less now than it was twelve years ago, as many valuable silver mines were compelled to remain idle.

Through the discontinuance of hydraulic mining the loss to the State in gold bullion amounts to over eight millions of dollars per annum.

But despite these hindrances and other retarding forces, mining for the precious metals has kept its place among our most important and useful industries. Though not so far advanced nor yet so prosperous as it should be, it is still in a promising and healthful condition. Its highest work, however, lies in the future; its greatest and best achievements await it. Purged of its abuses, aided by capital and prosecuted with economy, system and skill, mining is coming to the front, there to remain as almost the foremost industry of California.

Its stability is at least assured. It will remain with us as a long-lived pursuit. Why its life should not run with that of viticulture, grain-raising and other cultivated products, it is difficult to see. They are mining for gold and silver in South America, Mexico, India and other portions of the world where they were mining for those metals ages ago and where, no doubt, they will continue to mine for them for ages to come.

As now carried on in this State mining may be accounted an especially safe and profitable industry. For several years past there have occurred here very few failures, none of a signal or disastrous kind.

For a decade or more gold-mining in California has involved as little hazard as fruit, grain or cattle raising, nor has it proved less remunerative than either. Our miners are at the present time suffering less financial embarrassment than our farmers, merchants or any other class of the business community. While our miners, as a whole, have not of late years been growing rapidly rich, they have been doing fairly well, and now are for the most part in easy circumstances. They have no bad debts, nor are they loaded down with liabilities and unavailable property, such as encumber many other occupations.

While the tillers of the land in the mountains are so wholly and immediately dependent on the miners for their subsistence, it is still the case that the entire commonwealth is also largely benefited by these pursuits.

There is not in this State a class, interest or vocation but profits directly or remotely through the labors of the miner, who, while he aids every other craft and calling, competes with none.

Our iron mines have not been extensively worked, owing to the large amount of capital required to erect smelting plants and to the high price of labor and fuel. Very large deposits exist throughout the State; hematite, limonite and magnetite predominate. Placer County yields chrome ores in appreciable quantities. It is only a question of time when California will produce the enormous quantities of iron it consumes yearly.

The extraction of copper ore has been principally confined to Calaveras, Shasta and Nevada counties. Our lead product is derived chiefly from silver ore (or from lead ore containing silver) in Inyo and San Bernardino counties. What with tin ore in San Bernardino, nickel ore in Monterey County, antimony ore in San Benito and Kern counties, California is the grand source of all useful metals and minerals. The New Almaden mine in Santa Clara County is the largest producer of quicksilver in the State. Next in importance are the cinnabar mines in Fresno, San Luis Obispo, Trinity, Napa, Sonoma and Lake counties.

To sum up, it may be said that the mining interests of California, especially those relating to the precious metals, are in a reasonably prosperous condition, and will not only maintain this place, but will increase the present generous contribution to the general wealth of the State.

WITH THE WOODMEN.

The forests of California are among the wonders of the world, and the lumber industries they give rise to are among the most important on the coast.

The chief growth is the redwood, which yields so enormously that the State Board of Forestry estimates that redwood forests comprise half the timber in California, and this though the redwood is confined to the coast, while the area of timber lands in the interior is many times more than that on the coast.

Other trees used in the lumber trade are sugar pines, often found 8 feet in diameter and of immense height without flaw; willow, cottonwood, sycamore, oaks of all kind (including chestnut oak, whose bark tans the famed California sole leather), laurel or bay wood. Redwood burl is an excrescence growing on the sides of the tree, which makes elegant veneering.

In the United States there are 466,000,000 acres of timber land, exclusive of Alaska. Of these 53,000,000 are divided among the Pacific States. These do not include unmerchantable timber.

California has a forest area of more than 18,000,000 acres.

Some idea of the volume of the lumber industry may be gathered from a brief presentation of figures regarding it taken from a single representative county—Humboldt.

Of 938,000 acres in Humboldt County classified as timber lands about 538,000 were originally covered with redwood forest, leaving about 400,000 acres of other timber, divided about equally among pine, spruce, fir and cedar lands, and lands covered principally with madrone and laurel and tanbark, and white, black and live oaks.

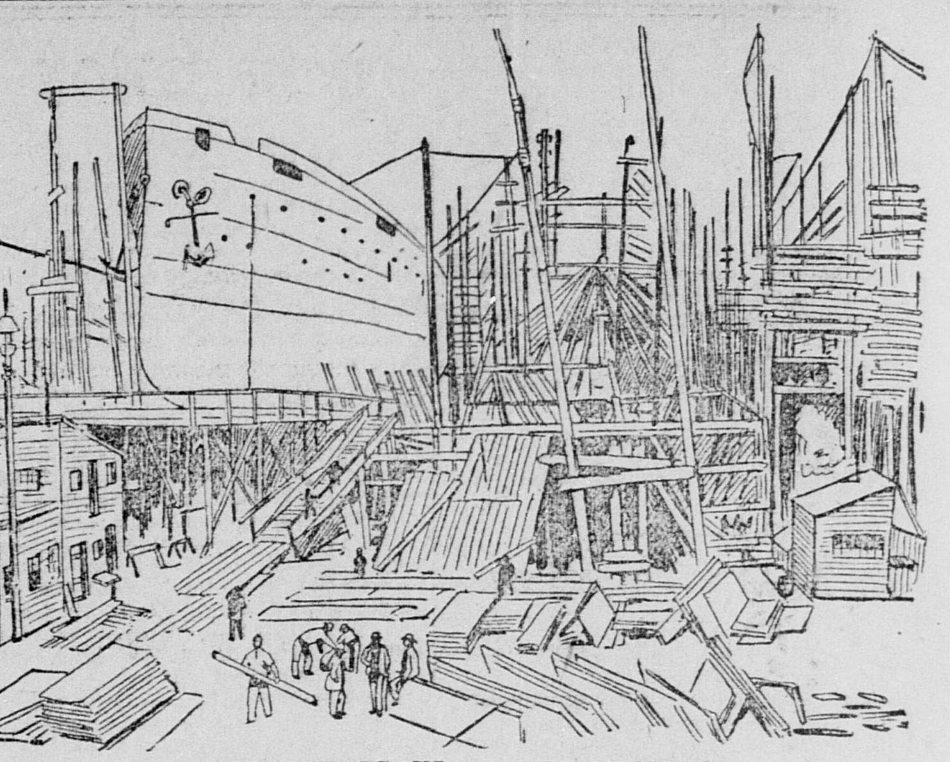
Of the redwood lands some 39,500 acres have now been cut and sawed into about 4,000,000,000 feet of timber, leaving 498,500 acres standing, which at the conservative estimate of 100,000 feet per acre will produce 49,850,000,000 feet of lumber. The present rate of cutting is about 200,000,000 feet of lumber per year.

From the port of Eureka the lumber fleet, together with the passenger steamers, took away during 1891, 152,517,613 feet of lumber, which includes shakes, shingles, pickets, etc., valued at $2,897,834.

Of this amount 9,998,663 went to foreign ports, as follows:

To Honolulu	3,937,193
To Sydney	3,796,644
To Guaymas, Mexico	459,161
To La Paz, Lower California	259,852
To Valparaiso	332,336
To Callao	284,007
To Victoria, B. C	182,679
To Central America	246,840
To Tahiti	208,951

Fresno is another large lumber center, as is



SHIPBUILDING IN SAN FRANCISCO.

Mendocino, and altogether it has been estimated that the annual production of lumber in the State is not less than 300,000,000 feet.

Dr. Kellogg, in his "Forest Trees of California," says that "probably from a fair estimate of the redwood along our coast it would not comprise more than 3000 square miles of forest land."

The amount of timber now standing has been variously estimated, rating all the way from 25,000,000,000 to 100,000,000,000 feet board measure. While in some sections the land will not yield more than from 10,000 to 15,000 feet per acre, there are others which will yield from 250,000 to 500,000 feet, so it will be seen how difficult it is to figure the total closely.

As previously indicated, the redwood belt is located on the coast of the Pacific Ocean, and between it and the interior of the State lies the Coast Range. For this reason the railroad touches it at only one or two points, and almost the entire product is transported by water. Both steam and sailing vessels are used for this purpose, and the capital employed in the lumber-carrying trade is a very important factor in the commercial interests of our State.

There are about forty mills engaged in cutting redwood, the largest having a capacity of 75,000 to 80,000 per day. Perhaps the average capacity of them all would be about 50,000 feet per day.

There was manufactured and shipped from the redwood mills in Mendocino and Humboldt counties during the year 1891 about 230,000,000 feet. Of this about 12,000,000 went to foreign countries, while the balance, 218,000,000, was consumed in the Pacific States or shipped to interior States.

A recent writer thus enumerates the widely diverse purposes for which this remarkable wood is so largely in demand:

"The heavy wood placed in the underpinning of a house or for fence posts lasts for many years. For railroad ties it is used to the exclusion of all other timber on the Pacific Coast, the ordinary life of a redwood tie being from ten to twelve years, while a pine will hardly last four or an oak six. A roof covered with redwood shingles will last until the nails rust off. For outside or inside finish the ease with which it is worked into brackets and moldings, and the quality of never swelling or shrinking when once dried, causes it to stand without a rival, while its great variety of color and grain and its susceptibility of receiving a high finish bring it into great favor with those who desire novel effects in interior decorations.

"Containing no pitch or resin, it does not burn with the readiness or heat of pine, and is more easily extinguished, an important quality which insurance agents have recognized in fixing the rates of insurance. There is in Humboldt County a 'fireproof' warehouse built of heavy redwood plank; also a theater now building, which is being protected from surrounding buildings in the same manner.

"For fermenting wine tanks it is far superior to pine or any other wood. The insect which frequently troubles wine-makers by boring through the tank-staves never troubles redwood."

The attention of California has been directed of late years to the intelligent preservation of her valuable forests by the limiting of waste.

During recent years many petitions and memorials have been addressed to Congress by citizens of the State urging the extension of the reservation system and the withdrawal from entry of all timber lands in the Sierras remaining unsold.

The Paddock bill "for the protection and administration of the public forest reservations" is one immediate result of this movement.

It is not intended to hamper or retard the legitimate lumber interest, but has for its aim the husbandry of that great interest as well as the preservation of valuable watersheds which may be maintained as the storehouses of great agricultural wealth.

On this point the State Board of Forestry says: "The water flowing in California rivers is more precious than the gold lying hidden in their sands. So long as the forests cover the mountainsides the streams will flow with some evenness throughout the year; but when the forests disappear the rivers will become rushing torrents in the spring and dry arroyos all the rest of the year. The forests of the Sierra Nevada are the natural reservoirs for irrigation of the San Joaquin valley.

"Hitherto the mountains have been left to the sheep-herder and the millman, who have wrought destruction unheeded and unchecked. Sheep-raising and timber-cutting are legitimate pursuits and entitled to fair treatment, but as conducted in California for many years they have not been conducive to the general welfare. The millman has slashed the forests recklessly, wasting more than he used and not confining his operations to his own property. The sheep-herder, caring only for pasturage, has set fire to the brush annually, burning off the young growth and killing the large trees. The seedlings and shoots that escaped the forest fires were destroyed by the sheep. And so not only has the mature forest been greatly injured but the total extinction of the forest growth made inevitable unless the work of devastation be stopped."

This indictment, of course, covers a particular section, but redwood forests everywhere should be guarded on account of their immense value, which is probably greater than any forests of equal area on the earth.

PADDOCK AND RANGE.

At various times considerable stress has been laid by objectors in general to the attention given to the horse. Despite this objection, however, California, as a home for great horses, is becoming more and more known, and the breeding of horses is becoming more and more important in this State.

By the roll of 1880 the total value of horses in California was $9,655,553; in 1892 their value by the same measure was $17,129,493.

Divided into classes the increase in value in thoroughbreds was nearly $600,000; in graded classes something more than that figure; in the common classes nearly $1,500,000; in colt classes nearly $1,250,000; in the "American" class, which embraces the American "trotter," the increase is nearly $3,000,000.

In this connection the Secretary of the State Agricultural Society, in his latest report, says:

That the noble animal, the horse, is part and parcel of California's renown cannot be further denied. The great battles for supremacy waged under the auspices of the society right here at home encouraged our breeders to go forth and meet the world with their products, and the result is that one of our great sires has, during the season just closed, acquired a worldwide reputation by having eight of his get obtain records of 2:15 or better, and only second in the list of money-winning sires in America.

Is not this an accomplishment of untold benefit to the climate and soil of this richly endowed State?

Another mighty one obtained the world's stallion record, so that we—California, the land so noted for its production of gold, of grain, of wine, of wool, of fruit, of timber, of hops, of everything, we might say, that is in any way connected with soil produce—have, at this writing, the fastest individual stallion of the world; the sire of the greatest number of extreme speed performers in the world; the sire—recently dead—that produced the greatest number of horses with trotting records of 2:30 or better; the largest thoroughbred stock farm in the world. Is not this fame?

When we state further as a fact that this State annually sells the greatest number of thoroughbreds in the New York market that come from any one breeding farm, amounting in the aggregate to $120,000, and that the sales of trotting stock aggregate $500,000 yearly in the same market, and that California sales here at home of improved-bred stock reaches $300,000 per annum, making an aggregate of nearly $1,000,000, can it be longer doubted that the interest in question is of some importance to California?

As a necessity, as a luxury, as a resource for the small breeder and as a profit the American trotter has come to stay, and California promises to be his home, where he will receive all visitors and where the breeder of the future will locate for his own protection. Up to ten years ago $12,000 was a phenomenal price for a trotting-bred animal. To-day can be counted by the dozen California-bred horses that have been sold for or had sums refused double that figure.

As an introduction to 1892, a California-bred three-year-old sold for the highest figure, $125,000, then ever paid for an animal of any age, size or breed in the United States, and that horse held, in 1891, the world's record (2:10¾) for a two-year-old.

To the great States of the East went Arion, as did Sultan, Alcazar, Mascot, Anteeo, Antevolo, Bell Boy, St. Bel, Ansel, Director, Sidney, Stamboul and Woodnut at an average price of over $40,000, though scarcely one could be repurchased for less than $50,000. Director sold for $55,000, Sidney for $50,000 and Stamboul for $41,000.

Electioneer is dead and to-day, perhaps, Guy Wilkes, valued at $100,000, is among our best, if not the best horse in the State.

But Ormonde, the $150,000 beauty, will soon be here, and we have still Palo Alto, Sable Wilkes, Direct, Eros, McKinsey, Silas Skinner, Hawthorne, Amigo, Advertiser, Guide and Albert W, besides others of less note.

The following list of prices paid for California trotting stock will prove of interest: Arion, $125,000; Anteeo, $55,000; Bell Boy, $51,000; Stamboul, $41,000; Sunol, $41,000; Antevolo, $35,000; Mascot, $26,000; Alcazar, $25,800; Athel (Baby McKee), $25,000; Palo Alto Belle, $15,100; Electric Belt, $12,500; Margaret S, $10,250; Suisun, $10,100; Ansel, $10,000. Thoroughbreds—Ormonde, $150,000; King Thomas, $38,000; Tournament, $33,000.

The result has been a run upon California sires that has somewhat alarmed the thoughtful, but intimations are not wanting that steps have already been taken to import the most fashionably bred brood mares, colts and fillies to maintain the character of the California racing stock. This is considered the vital policy of the day.

To California has fallen a lot of some moment in the breeding line, viz.: That one stock farm should produce and hold the record for a short space of time for the fastest one, two, three, four and five year olds, as well as the stallion trotting record for the world, and that subsequently another farm in the same State should wrest the laurel of the yearling record from the garlands of the first, and when 1891 closed California held the trotting and pacing records of the world."

The sales of our stock by auction in the East have shown greater averages than any other State, and as long as we have the corps of stallions and the stock of matrons we are now possessed of it is thought we shall hold up the already achieved glory and fame of California horses, both in the hard-fought contests of the grand circuit in the East and as record-breakers over our own ground.

Additional value is now given to the thoroughbred by reason of the great success of his blood as an outcross for the trotter.

Experiments recently made by one of our leading breeders removes all doubt as to reality on this score. Breeding of trotting-bred mares to thoroughbred sires and recrossing the female offspring of such with a trotting sire, has resulted most successfully. It has always been admitted that all the speed came from the thoroughbred, but it has been left to a Californian to make the success of extreme trotting action from this blood.

HYDRAULIC MINING.