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CALIFORNIA

EARLY HISTORY : COMMERCIAL POSITION : CLIMATE : SCENERY FORESTS : GENERAL RESOURCES IRRIGATION : MINING : AGRICULTURE : HORTICULTURE : OLIVE CULTURE : CITRUS CULTURE THE SUGAR BEET : RAISIN GROWING : TRANSPORTATION : FRUIT CANNING : DAIRYING : POULTRY RAISING : FLORICULTURE : LIVE STOCK : SHEEP HUSBANDRY : FORAGE PLANTS : EDUCATION RELIGION : POLITICAL STATUS : IMMIGRATION CALIFORNIA AND THE INSANE : LICK OBSERVATORY : SAN FRANCISCO : LAND VALUES : VITICULTURE : FOOD FISHES.

"'Tis the land of the morn-bright mountains
With the purple vales at their feet;
Of the clear, swift-flowing fountains
And rivers of waters so sweet;
Of the deep wood bowers entwining,
Of the cataract's sounding roar,
Of lakes in splendor shining,
And the pine-trees whispering o'er."

1897-98.

CALIFORNIA STATE BOARD OF TRADE,
SAN FRANCISCO, CAL.

H. S. Crocker Company, Printers, S. F.

THE EMPIRE BEYOND THE ROCKIES.

Some of its Newspapers—The Los Angeles Times.

From "American Journalism," a notable book recently from the press of the Holmes Publishing Company, New York, the following extracts are taken:

(P. 285):....The notable newspapers of the Empire beyond the Rockies are the Salt Lake Tribune and Herald; the San Francisco Examiner, Chronicle, Call and Bulletin; the Oakland Enquirer and Tribune; the Sacramento Bee, the Portland Oregonian, the Seattle Post-Intelligencer and the Los Angeles Times. The last belongs to the big four of the Coast, namely, the Examiner, Chronicle, Oregonian and Times.... To average advertisers the one hundred thousand population of Los Angeles equals in value two hundred and fifty thousand population anywhere else. It is a city of beautiful homes. In a city like this one expects newspapers of the best Eastern stamp, and he is not disappointed—in one instance at least.... The Los Angeles Times is unique in the fact that, while being the highest class newspaper in the West, it has the largest circulation in its territory.... The large advertisers and prominent people whom I interviewed in Los Angeles gave The Times a pre-eminent place. It has half to a third more circulation than any paper in the Southwest, and carries more advertising than the other three Los Angeles papers combined.....

(P. 344): The Times belongs to the short list of America's greatest newspapers. It deserves to be mentioned with the New York Tribune under Horace Greeley, the Philadelphia Ledger under George W. Childs, the Chicago Times under Wilbur F. Storey, the Chicago Tribune under Joseph Medill.... Not more than two or three newspapers in the United States have anywhere near as much success in proportion to their field, or such a lead over their competitors. Every large advertiser in Los Angeles places the Los Angeles Times incomparably first in its own field..... "It is the best newspaper west of the Rocky Mountains," said a prominent citizen of California. "There are only three newspapers on the Pacific Coast that have paid during the last few years, and The Times is one of them," said a well-known journalist who has studied this question from the inside. "The most gratifying thing about The Times is the fact that it is a high-class paper that caters only to the best elements in the community, and yet it has very much the largest circulation in this field. "We spend all of our appropriation in The Times," said the largest local advertiser in Los Angeles, a firm that does a business of three-quarters of a million dollars and spends $30,000 or $40,000 in advertising annually.... The Times carries an enormous amount of advertising at exceedingly good rates. It has from 25 to 35 columns of advertising daily, and from 85 to 140 columns on Sundays. Its classified or "liner" advertising reaches from 7 to 9 columns daily, and from 27 to 35 columns on Sundays.... It is only in Chicago and Washington that advertisements are set as well as those in the Los Angeles Times.... Some of its announcements suggest the best "ad" writing in the East.... The Times gets up its "liners" better than any paper in the country, except the Washington Star. "Brains" (New York) frequently reproduces handsome display advertisements from The Times, which abound in originality and artistic effect, yet are never freaky.... The Times suggests the best dailies in the largest cities. It has a very complete news service—the Associated Press and a great deal of special correspondence. It prints from 10 to 16 pages daily, set on 12 Mergenthaler machines. It is printed on a Hoe double insetting press—the "Old Guard"—and on a special press, the "Columbia," both built by R. Hoe & Co. ["Columbia II," a quadruple machine, has since been added.]..... It is a complete newspaper establishment, up to date in everything.... The Sunday Times is a 28 to 36-page paper.... The Times is one of those papers that prints the news, and a great deal more than the news, but never distorts the news.....

In the absence of Colonel Otis, on a trip East, I interviewed Mr. L. E. Mosher, the vice-president..... Mr. Mosher called my attention to the detailed statement of The Times circulation..... It is the most complete circulation statement made by any newspaper in the United States.... It gives the total number of copies circulated each week, and the daily average. Under about 50 sub-heads it shows just how many papers go each day in the week to every town or news agent that takes over 20 newspapers daily, and it summarizes 86 other towns that take in the aggregate about 700 copies of The Times daily, and it gives the names of these 86 towns.... It also tells how many papers go to the newsboys, the news companies, to California subscribers and to Eastern subscribers. It prints the affidavit of the Superintendent of Circulation and the affidavit of the pressman. The pressman swears as to how many copies are printed each day in the seven. It quotes the law which makes it a penal offense to misrepresent circulation for the purpose of obtaining patronage.... The Times has never attempted to gain readers or popularity by cheap methods, but it has done much for Los Angeles.

....Los Angeles was not an extensive community in those days—1881-82 [when the paper was started]. The Times was a potent factor in its growth [the city has grown from 12,000 in 1882 to 103,000 in 1897], but The Times has grown faster than has Los Angeles. I don't mean to say that it has outgrown its field, but it certainly has so thoroughly filled it as to leave no room for competition.

[The subscription price of The Times, which is a seven-day paper, is 75 cents per month, or an average of 2½ cents per copy to regular subscribers. Its circulation averaged during the eight months of 1897, up to August 31st, 19,004 copies daily; the Sunday circulation averaged, during the same period, 25,015 copies.]

INTRODUCTION.

THIS book was planned, and is published, for the purpose of affording answers to inquiries which naturally arise in the minds of intelligent strangers concerning the land in which they are visitors. The articles it contains were prepared, at the solicitation of the California State Board of Trade, by the most eminent and distinguished writers of the State, especially qualified to present, in a comprehensive but condensed form, the various subjects assigned them.

It anticipates and answers a broad range of questions on the part of the intelligent stranger who desires to be made acquainted with the industrial, commercial, social, moral, educational, and religious conditions of the country he visits, as well as furnishes information to the home-seeker, whose desire and duty it is to know something of the *status* of civilization with which he is to cast his lot, and of the present and prospective prosperity of the commonwealth of which he desires to become a citizen.

The gentlemen whose names are signed to the articles herein published need no introduction to the public, and many of them possess national reputation. But as a courtesy to the stranger who may desire to know something of the author whose work he reads, a brief summary of articles and authors is presented.

The "Historical" chapter is written by D. R. Sessions, for many years a student of the history of the Pacific States and Spanish-American provinces.

"The Mining and Minerals of California," by Charles G. Yale, a pioneer miner and collector of mining statistics, and a leading mining expert.

"Mines, and the Record of Production of the Best Mines in the State," by C. E. Uren, an accomplished mining engineer.

"The Art of Agriculture as Practiced in California" was written by Alfred Holman, editor of the Rural Press, a native of the Pacific Coast, an experienced journalist, accurate observer, and entertaining writer.

The article on the Wine Industry of California is from the very facile pen of Charles A. Wetmore, who for many years has given this subject profound study. Whatever he writes upon the subject is accepted as authority among all persons intelligent on the subject of wine-growing.

One of the most valuable contributions to this work is an article from the pen of David Starr Jordan, President of the Leland Stanford University, on the Food Fishes of California. Dr. Jordan needs no introduction to the scientific world.

The chapter on "Irrigation" is by C. E. Grunsky, civil engineer, assistant to the State Engineer for many years, learned in his profession, and thoroughly familiar with the subject.

"The Horticulture of California" is treated by Professor E. J. Wickson, professor of horticulture in the State University.

The article on "The Climatology and Meteorology of California" is by Professor E. W. Hilgard, professor of agriculture in the State University.

The chapter on the subject of "Immigration" is from the pen of Col. John P. Irish, a well-known publicist, and a gentleman of national reputation.

"The General Resources of California" are exploited by General N. P. Chipman, a profound student of the industrial resources of the State of California; a distinguished lawyer, now holding the position of Supreme Court Commissioner.

"The Commercial Position of California on the Map of the World" is from the pen of Captain William L. Merry, Secretary of the San Francisco Chamber of Commerce.

"The Past and Present Status of Education in California" is by Professor Martin Kellogg, President of the State University.

"Scenic California" is from the graphic pen of John Muir, the distinguished geologist, well known in scientific circles throughout the world.

"The Forests of California" are described by Charles Howard Shinn, of the California State University.

The chapter on "Transportation" is carefully and thoughtfully prepared by Mr. W. G. Curtis, civil engineer and assistant to the General Manager of the Southern Pacific Company.

"The Indigenous and Adopted Flora of California" is by Professor Emory E. Smith, of the Stanford University.

"Dairying in California" is by Samuel E. Watson, President of the State Dairymen's Association.

"Poultry Raising in California," by J. A. Finch, a gentleman of broad, practical experience of the subject he treats, both in the East and in this State.

"Sheep Husbandry in California," by John H. Wise, Collector of the Port of San Francisco, a large and extensive wool-grower, a pioneer of the State, and a gentleman of accurate observation.

"The Political Status of California as Determined by Election Statistics" is by the Hon. Horace Davis, ex-Member of Congress and a statistician of distinction; late President of the University of California.

"The Culture of the Olive," by Elwood Cooper. Mr. Cooper was the pioneer olive-grower of the State, and occupies a leading position as an authority on all horticultural subjects.

"The Live Stock Interests of California," by Charles M. Chase, President of the State Agricultural Society.

"Citrus Culture in California" is from the pen of I. N. Hoag. Mr. Hoag has been a writer on agricultural subjects in the State of California for more than forty years.

"The Sugar Beet Industry of California," by Claus Spreckels, will attract wide attention. Mr. Spreckels is an undoubted authority.

The article on "Raisin Growing" is by Colonel William Forsyth, an experienced raisin grower of Fresno, California. He describes with fidelity the methods of cultivation, and gives interesting statistics of the commercial results of that object of culture.

"The Indigenous Forage Plants of California" is by Will S. Green. United States Surveyor-General of the State of California, and a pioneer writer of distinction.

"The Fruit-Canning Industry" is by J. H. Flickenger, one of the most successful orchardists of California.

"The Lick Observatory, and Its Contribution to the Science of Astronomy," is from the pen of Professor Edward S. Holden, the astronomer in charge of the observatory.

"The City of San Francisco" is by Edwin H. Clough, a well-known journalist of the State, a graphic writer, and a thoughtful observer.

"California, and the Insane," is by Dr. A. M. Gardiner, Superintendent of the Napa Insane Asylum. This article is presented to answer the charge that the climatic and other environment of California superinduces insanity.

"The Status of Religious Thought in California" is from the pen of Horatio Stebbins, Doctor of Divinity, who has occupied the pulpit of a large and influential church in the City of San Francisco for thirty-two consecutive years.

Attention is called to the article in this publication entitled "An Analysis of Land Values of California," in which the present *status* of land holdings and values is fully discussed.

In addition to these thirty carefully prepared articles will be found a brief statement concerning the numerical strength, the property values, number of ministers and the number of churches of the various religious denominations; also, statistics relating to finance, production of precious metals, agriculture, horticulture, mines and mining, commerce, fraternal organizations, social clubs, women's clubs and other industrial and social features, from which the inquiring visitor will be able to derive answers to a very broad range of intelligent inquiry.

While these articles will answer anticipated inquiry, they will not be devoid of interest to the people of the State of California.

Notwithstanding the broad field covered, it may not be out of place to remind the intelligent visitor that the American settlement of California was induced by an ardent and expectant search for gold; that when he measures the progress California has made in field-culture, he must keep constantly in mind the fact that its first occupants and inhabitants had no faith in its agricultural resources. Men are naturally intolerant as to the differences they encounter between the countries with which they are familiar and those they casually visit. Moreover, men, in seeking new homes, seek those where the industries they have pursued in the old are the standards of industry in the new. Of the truth of this every individual has a witness in his own mind. We are not attracted to the countries whose objects of culture are wholly unfamiliar to us. When an exhibition is spread before a spectator, that portion of it with which he is familiar and the result of that industry in which he is engaged will be most attractive, because it will be under the most familiar and intelligent observation. The people of the Temperate Zone, skilled in the field-culture possible in the latitudes of their nativity, find strangely unfamiliar objects of cultivation unattractive, when the proposition to engage in the cultivation of the unfamiliar object is under consideration. It is for this reason that men migrate upon the latitudes of their nativity. They seek new homes with more favorable environment for personal prosperity, but they do not seek a change of industry, which involves the abandonment of that with which they are familiar for the adoption of that which is new. They feel a confidence in the skill and judgment which

observation and experience have ripened in their minds, so long as the question of engaging in industries already familiar is presented; but they naturally lose that confidence when methods of agriculture and horticulture, relating to unfamiliar productions, are a part of the problem involved in the change of residence.

The agricultural and horticultural possibilities of California were a sealed book to the pioneer population of the State. The seasons for seed time and harvest were new and strange. The art of agriculture as it was known and practiced by themselves and their fathers was inapplicable here. This is not to be wondered at. The time of growth and verdure, as known to them, was from the spring month of April to the October of autumn. Then followed a winter of death to vegetation, a period of slumber, in which all growth was bound in icy chains and laid to sleep in the cradle of winter. To them, spring with its seed-time, summer with its ripening suns, and autumn with its golden harvests, meant certain specific months of the calendar. They found these months of the old calendar the winter of suspended animation in California. Instead of the June of verdure and blossoms, they found one of the russet-brown hills and sun-parched plains, with all the unmistakable conditions of the aridity of death. But on the other hand, they found a later autumn and a longer winter of verdure. Finally, the suggestion came that the old almanac was as inapplicable to the seasons of California as the old art of agriculture had proven. Instead of the winter of former experience, they found springtime to follow harvest, verdure to come with the rains of heaven, growth and vegetation belonging to the months relegated to the rigid bonds of winter in the homes they had left. Slowly the true meaning of the new environment began to be understood. The new art of agriculture followed the suggestion of new vicissitudes in nature, until to-day the art of horticulture and agriculture, as practiced in California, is not known elsewhere in the world, and it is to the material and moral results of this new adaptation of industry to a new environment that your attention is to be called.

The love of Californians for their State — which is proverbial — is not devoid of justification. What other country presents such inspiration of love and devotion? In what other country is there broader freedom of thought and action? In what other country are the alluring prophecies which attend young life more certain of fulfillment? In what other country do the higher blessings of peace and plenty minister to the comforts of age? Are there other countries in which honest industry achieves higher respect, or in which labor earns a higher meed of profit and honor?

Under our summer suns the fruits of the tropics ripen, unaccompanied by the discomforts of the torrid zone. Here the brown of our summer hills and the golden stubble of the after-harvest are the only winter we know. Here a spring-like verdure is the harbinger of the coming autumn, and the autumn is attended by no forewarning of the bleak rigors of winter. Here winter is the season when the warm, brown earth is turned by the plow for seed-time, and spring, with its flowers and ripening grain, is opulent with the prophecy of hopeful industry. Nor are these all the features which challenge our love of country. Here nature has wrought its best enchantments in the sublimity of mountain heights, the bold grandeur of cliffs, the pensive peacefulness of lovely valleys, and the expansive splendor of fertile plains.

Looking backward we see a history founded in the romance of adventure. In the present we are laying the foundations of a noble commonwealth by the establishment of permanent industries. If, therefore, the manifestation of love for our State may sometimes appear boastful or provincial, let it find apology in the consideration that provincialism is an expression of local patriotism, and that with the people of California it is the inspiration of high endeavor, which, when duly chastened, will ripen for our beloved State its growing harvest of hope.

WILLIAM H. MILLS,
Chairman of Committee on Publication,
California State Board of Trade.

Know'st thou the land where the lemon trees bloom,
Where the gold orange glows in the deep thicket's gloom,
Where a wind ever soft from the blue heaven blows,
And the groves are of laurel and myrtle and rose?

MISSION OF SAN JUAN CAPISTRANO, ORANGE COUNTY, CALIFORNIA.

EARLY HISTORY OF CALIFORNIA.

By D. R. Sessions.

ROMANCE IN THE NAME CALIFORNIA.

VARIOUS speculations have been put forward as to the origin of the name of California. There is little doubt, however, that it was derived from a Spanish romance entitled *Sergas de Espladian*, published as early as 1520, and brought to light again in 1862 through the researches of Edward Everett Hale.

The California of that story was a fabulous island lying "on the right hand of the Indies, very near to the terrestrial paradise. It was peopled with black women, without any men among them, because they were accustomed to live after the fashion of the Amazons. Their arms were all of gold, and so were the caparisons of the wild beasts which they rode after they had tamed them; for in the island there was no other metal."

The name was applied first to Lower California, Mexico, probably by Cortez, before any knowledge whatever had been obtained concerning the country which the world now knows almost exclusively as California. The romance that it embodies turns upon the Amazons of the pretty fiction; but as to the terrestrial paradise and the gold of the legend, it crystallizes a present material fact.

Etymology suggests nothing descriptive of the country to which the name is applied. *Caliente* and *fornella*, the Spanish for hot and furnace, may be fairly blended grammatically, and may aptly portray some burning island in the Indies, but not the real California, which is the real terrestrial paradise.

FIRST MENTION BY ENGLISH WRITERS.

It was not until 1579 that Sir Francis Drake paid his famous visit to California. "The World Encompassed" tells of much that he observed, and of some things that, perhaps, he imagined. Vancouver, who made his first voyage in 1792, was surprised that so small a force of soldiers could keep in awe so many thousands of natives! Cavendish appeared in these waters for the first time five years before Vancouver. In his report to the Lord Chamberlain he says: "I navigated along the coast of Chili and Peru and Nueva Espania (New Spain), where I made great spoils. I burned and sank nineteen sail of ships, small and great. All the villages I landed at I burned and spoiled." Woodes Rogers, the next English buccaneer in this order, was no less terrible than Drake and Cavendish. But he was either a poor observer or lacked the knack of telling. His voyage might have passed without record but for his rescue of Robinson Crusoe. Shelvocke followed Rogers, a few years later, into Porto Seguro by Cape Saint Lucas, where he gathered some glittering sand, being assured that it carried gold. Analysis revealed only the glitter. Rogers did make a discovery, however, which he chronicled as follows: "It is in a manner certain that the natives cannot be practiced in any sort of labor, except that of hunting and fishing."

VISIT OF SIR FRANCIS DRAKE.

Half of June and nearly all of July Sir Francis remained in a harbor not more than two miles north of the Golden Gate, that is, in about 38° 30′, where he grounded his vessel for repairs. He took care to put up a stout fortification at once, to protect himself against the natives! He soon found out, however, how groundless were any fears of Californian savages. Simple creatures, they were friendliness and humility personified, in the presence of their wonderful visitors. The whole neighborhood, men, women, and children, flocked down to the shore to see them. The warriors, in token of instant submission, laid down their bows and arrows, while the women, to convey the same idea, shrieked piteously, tore their flesh, and cast themselves repeatedly and violently against the rocks

and stones. The men advancing, placed a feather crown on Drake's head, threw wampum strings around his neck, and with song and dance hailed him as their *hioh*, chief.

Whatever Sir Francis may have really thought these actions meant, he willingly accepted the proffered sceptre and sovereignty over a vast territory, and took formal possession on behalf of the queen. He made a short excursion into the country, and reported the green slopes covered with "big fat deer," and other game. It is not unlikely that the big fat deer referred to were elk, which at a later date, but still in the early history of California, were found in droves not very far from Drake's camp under Point Reyes. He recounts no adventure with bears, hence it may be inferred that he did not see a grizzly.

OCCUPATION OF THE MISSION FATHERS.

In 1769 four expeditions were dispatched from Mexico to San Diego Bay, two by land and two by sea. After a good deal of suffering and delay, all four of the parties arrived, and on July 16th the Mission of San Diego was founded, and the nucleus of the oldest city of California established.

These expeditions were military and ecclesiastical combined. The head and soul of the ecclesiastics was the Franciscan priest, Junipero Serra, a priest of exalted character, whose enthusiasm fell but little short of inspiration. For, crippled and scarcely ever free from pain, he labored right on zealously up to his death, as though unconscious of the infirmities of his body.

The plan of the Franciscans for converting the Indians included the building of churches, around which the fathers, *padres*, lived, instructing their pupils in faith, and requiring them to labor and live in the ways of civilization.

By the end of 1700 there were eighteen missions with forty *padres* and a neophyte population of 13,500. Crops as high as 75,000 bushels were by this time produced, and there were 70,000 horses and cattle, while the mission property was valued at $1,000,000. When, in 1837, the secularization of the missions by the Republic of Mexico became complete, many of them began to fall into decay. The Indian converts, being thus released from the control of the fathers, relapsed into their former ways of living. One can only look back with respectful regret upon the labors of the zealous, if not always wise, Franciscan fathers. To California of the present day the missions are little more than a memory. Some pretty legends grew out of them, and they call up examples of exalted character and devotion. As a means of colonization, they were useful; but as a means of spiritual growth among the Indians, they are not a memorial of achievement.

CHARACTER OF SPANISH OCCUPATION.

The Spanish government extended its arm over the early missions, providing a *presidio*, or military station, near by each of them. The *pueblos*, which also were somewhat of an accompaniment to the missions, were towns established to promote settlement of the country. They maintained local civil government, independent of church or military rule. The *alcalde* was their chief officer of justice; he with other, but subordinate, officers formed the *ayuntamiento*, or common council, of the larger towns.

In 1822, when Mexico became a republic, a convention of Californian officers assembled at Monterey and gave assent to the new government. The first legislature under Mexican régime convened the next year. The Californians, however, did not feel dependent upon Mexico; a spirit of local independence developed rapidly among them during the decade preceding the conquest in 1846. This period was distinguished by jealousy of Mexican control and political feuds between rival factions around Monterey in the north and Los Angeles in the south. These feuds were never wanting in demonstration of valor, but always passed over without bloodshed.

The white population of California, in 1846, was about 1000, chiefly of Spanish lineage. Their principal occupation, hardly laborious enough to be termed an industry, was the raising of cattle for their hides and tallow, which they sold or bartered to American coast traders for manufactured articles of the kind suited to their bucolic needs and peculiar fancies. Their life was unprogressive, simple, and kindly, much given to hospitality, visitings, picturesque apparel, gay colors, and *fiestas*. Without exception, the Californians were skillful riders, natural musicians, and graceful dancers. Quick-witted, cheer-

ful, and apt in conversation, their home life morally pure and wholesome, they were, in some respects an ideal people, lacking, however, in the character fibre to withstand the coarser influences of a commercial civilization.

AMERICAN OCCUPATION.

At the outbreak of the war with Mexico the United States was represented in California by a considerable number of prominent residents, by Fremont's party and, shortly after the declaration of war, by warships under the command of Commodore Sloat. There was no organization among them, nor does there seem to have been any plan by which they were directed from Washington. They all appreciated the benefit to the United States of the acquisition of California, and were all animated by that idea, but each acted mostly on his own responsibility. A scramble resulted, terminating in conquest.

The difficulty between Fremont and Governor Castro, which had startled the Californians and aroused them to resentment, was followed, June, 1846, by another act, for which there was no apparent purpose or excuse; a party of Americans seized a band of horses belonging to the Californian government and drove them to Fremont's camp. Another party of Americans, also without ostensible plan or reason, took possession of Sonoma, and having made prisoners of General Vallejo and three other gentlemen, sent them to Sutter's Fort. The main body remained in the helpless little town and entertained themselves with spread-eagle speeches and proclamations about "the new State," "another star in the constellation," etc. They also raised a flag made out of white cotton cloth, on which, with berry juice, was stained the figure of an animal purporting to be a bear. This was the famous "Bear Flag Revolution."

On July 7th Commodore Sloat raised the stars and stripes at Monterey and took possession of that town. The same ceremony was performed on the same day by somebody else at Yerba Buena.

Flushed with these victories, Commodore Stockton, to whom Sloat resigned his command, and Fremont began operations, with Los Angeles as military headquarters. Except for the battle of San Pascual, in which Kearney, with his half-famished battalion, was not able to dislodge the Californians, there was no war.

D. R. Sessions.

THE COMMERCIAL POSITION OF CALIFORNIA.

By William L. Merry.

IN the consideration of California's commercial status, the future must be considered even more than the present conditions. California occupies a remarkable commercial position, considered in any sense. With her northern limit in 42° north latitude and her southern extreme at 32° 32′ north, this great State spans nearly ten degrees of latitude. The seacoast of California equals half the coast of Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, and to a point twenty miles south of Charleston on the coast of South Carolina—ten Atlantic seacoast States! Her area of 188,961 square miles equals that of all the New England States, New York, Pennsylvania, and Ohio, *combined.* In this immense area we now have about one and a quarter million inhabitants, while France, with 202,579 square miles area, has thirty-six and a half millions, approximately. *California can maintain in comfort a population of thirty-five millions.* It has at this time hardly emerged from the pioneer condition as regards population, while her position in respect to a high civilization equals that of any State in the Union. Who shall precisely forecast the commercial future of this imperial commonwealth?

Commercial conditions are always largely controlled by climate, and in this California

is unique. Every known climate may be found within her borders, except the strictly arctic and the subtropical. On her great seacoast almost perennial polar winds are blowing, creating a distinctly different climate from the interior. San Francisco is situated in this marine climate. Visitors may note ladies in our streets wearing Arctic furs in January and in July, without necessity, save as a mandate of fashion, in either case. But leave the coast for the interior, east of the mountains nearest the Pacific, and another distinct climate is encountered, with a high, dry temperature in the daytime during summer, and cool, but not cold, winters. Again, ascend the Sierra Nevada at its eastern borders and find a mountain climate, cool in summer and freezing in winter. At its northern extreme the seasons somewhat resemble our Eastern climatic divisions, while south of Sacramento we have no longer winter, but a dry and rainy season, with hardly distinguishable spring or autumn.

These striking differences in climate create the possibility of a diversified production, unequaled by any State in the Union. Anything that the world produces can be grown in California, except subtropical products. This pregnant fact is the gauge of her commercial possibilities, limited only by her accessible markets.

Cheap transportation for her products to the markets of the world—that is the main question which controls her future commercial possibilities. The brilliant intellect of that great statesman, William H. Seward, when he purchased Alaska, looking into the future with prophetic forecast, declared that "*the Pacific Ocean would become the scene of man's greatest achievements.*" In this great history California will make her mark. Facing the Orient, Oceanica, and Australia, who shall limit her ocean commerce westward? Her ships cross the meridian westward to reach the so-called "Far East." From the dream of centuries, Japan is already awake, and China at last shows the effect of increased contact with modern civilization. Australasia, peopled with our own race, already invites our commerce, and Asiatic Russia reaches for Pacific waters with the longest railroad in the world. The ocean steamship on the surface, and the electric cable on the bottom of the great Pacific, are to become the prime agents in this great commercial development, which will unite California and her sister States on the Pacific to the "Far East." Commerce, recognizing no creed or nationality, aided by steam and electricity, will solve the problem of her commercial future!

Let us now look *eastward*, toward the Atlantic Ocean. How strikingly different are the conditions! A continent 3200 miles from ocean to ocean, with California on its western limit, and two great mountain chains to be surmounted—an immense empire between the oceans, already the seat of unequaled commercial, manufacturing, and productive activity; beyond that another great ocean, but only about half the width of the Pacific, and then *Europe*, peopled by our own race—the seat of modern finance, science, civilization, and learning; her lands crowded with a population demanding our products, and ready to aid in the development of our Pacific Coast when it can be reached with economy in time, distance, and cost.

Our country spans the continent—truly a goodly heritage for a great people—a land wherein are being solved the great questions of modern civilization, with a commerce urgently demanding room for expansion. Across this great continent, as upon the ocean, *steam* and *electricity* are the great factors eliminating distance. A magnificent railway system supplies the demand of our people for rapid transit, while electric wires furnish us with the news of the world hourly. The communications so liberally provided in railroads by the energy and power of capital are worthy of all praise and admiration, but they have only supplemented what has been provided by nature. *Water transportation* is also necessary to give due effect to the industry of our people. Railroads must necessarily absorb an undue share of the earnings of production in order to assure profits to the great capital employed in their construction; but they also confer untold benefits, supplying the transportation for perishable and valuable property, securing rapid movement of mails and cheap carriage for our people. The development of our great interior would have been impossible without them, and cheap water transportation, comparing in cost at the ratio of one to ten, to one to twenty, will supplement their usefulness without decreasing their earnings.

From the great markets of our Atlantic seaboard and Europe, California is separated by the extension of the Western Continent far into the Southern Ocean. The Cape Horn passage is behind the demands of our age, and commerce, with increasing anxiety, awaits

the opening of a *short water route*, by which our increasing products can cheaply and promptly reach Atlantic markets. What the railways cannot profitably carry to the Atlantic Coast of our country, and what the great centers of population in Europe need of our products, seek this great interoceanic highway, thus far in vain; but the day is not far distant, when through the inland sea of Nicaragua will pass a stately procession of ocean carriers, laden both ways—with the products of our soil eastward, and with the manufactured products and immigration of our eastern seaboard and of Europe, westward.

Then will have arrived the time when it can no longer be asserted that "the Great West has everything to offer the immigrant save cheap transportation." No matter how cheap by rail, it cannot be made cheap enough to pay the cost of production as regards the bulky products of our soil and industry, and leave the railroad the cost of carriage. Then the immigrant may grow all the products he desires; the mills may cut all the lumber they can handle; the miner produce all the ore that has value — *all* will have a market open to them at prices which will encourage the producer, the mechanic, and the miner. Our lands will become populated, our cities prosperous, and our people contented in the steady development of our State. How illogical the idea that land transportation will not share in the benefits of this great development. How can land carriers suffer when at first hundreds of thousands, and later millions, are added to the population of California? Then will California, facing the "Far East" westward, and Western Europe, as well as our Atlantic coast, *eastward*, fulfill her commercial destiny. With an ocean highway eastward and westward, supplementing the magnificent railway systems already at her command, she can bid a friendly commercial defiance to the world, and still say to our countrymen who crowd eastern centers of population: "Come westward and help us; we have here a glorious heritage — room for all who will work, and a market open to them for all they can produce!"

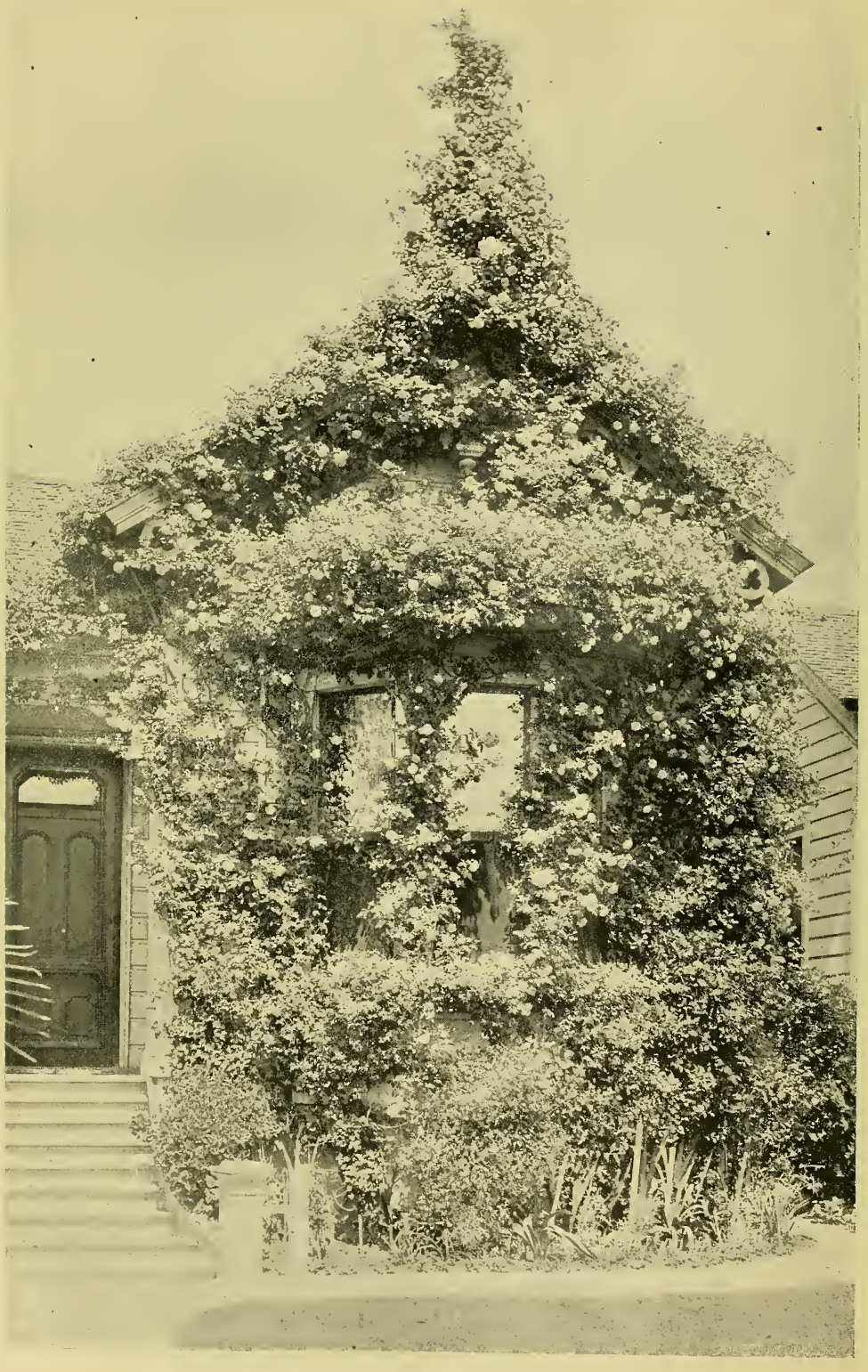
As "*eternal vigilance is the price of liberty*," so, under our form of government especially, "*eternal persistency is the price of success.*" It accomplished the boon of rapid land transportation, without which our State would have remained a provincial community, and it will accomplish the great interoceanic waterway for which we have so long waited. Then both eastward and westward we shall face the commercial world on even terms for the first time. The pioneer conditions of the past and the comparative commercial isolation of the present will have become ancient history, and California will meet the commercial world, asking only a fair field and no favor. Equidistant between the Orient and Europe, with her seaports on the line of navigation between them, she will forever remain in close touch with the commerce of both. Her commercial position will have been so radically improved by the elimination of ten thousand miles sea carriage that her land transport system will be as greatly benefited as her people, and we shall wonder at history repeating itself, in the fallacy of human judgment that feared the result of increased facilities for cheap transportation as a danger to vested interests already secure in the patronage of an empire which cannot possibly live on the basis of modern commerce and civilization without them.

William L. Merry.

THE BIRTH OF A FLOWER.

When Israel's Captain bade the sun stand still,
Loosed from the orb, a million flakes of flame
Were wafted down on meadow, vale, and hill,
And so to earth the golden poppy came.

—*Philip Morse.*



ROSE-COVERED COTTAGE IN CALIFORNIA — CHRISTMAS.

CLIMATE OF CALIFORNIA.

By Prof. E. W. Hilgard.

CALIFORNIA extends through nine and a half degrees of latitude. If it were placed on the Atlantic coast, it would reach from Savannah, Ga., to Boston. The length of the State is about 750 miles, its average width about 200 miles. With such dimensions "California climate" is, naturally, not a very definite quantity. California is a land of many climates — from the hottest subtropical to the cold temperate, and from the driest desert to the most humid régime of the higher mountains and northern coast.

Along the coast, owing to the tempering influence of the sea and the trade winds which usually blow landwards across the cold Alaskan current (see map), the climatic conditions from north to south are much more equable than on the Atlantic coast. The most rapid changes occur from the coast eastward, across the State. Thus one can start on a cool, spring-like morning from San Francisco, by noon endure summer heat in the Sacramento Valley, and before night be amid the snows of the Sierra.

On the east the Sierra Nevada forms a natural boundary line; the mountains rise very gradually from the west, to a height of from 8500 to 14,000 feet — considerably above the snow line, so that some small glaciers still exist. On the eastern side the Sierra falls off abruptly to the Nevada Plateau, itself some 4000 feet above sea level.

The Coast Range Mountains form a broad belt, running along the entire length of the coast. They usually consist of two or three parallel ranges, seldom over 3200 feet high. Between these ranges lie numerous fertile valleys, sometimes of considerable extent. These valleys nearly all trend toward the northwest — an important factor in their climatic conditions.

Between the Sierra Nevada and the Coast Range belt lies the Great Central Valley of California, approximately outlined on the map as a region of low rainfall. It is about 400 miles long and fifty to sixty miles wide. This is a fruitful agricultural district, with very little waste land, and covers fully one ninth of the State; when watered it is of great productiveness almost everywhere. Through the northern portion ("Sacramento Valley") runs the Sacramento River; through the southern ("San Joaquin Valley"), the San Joaquin River. These rivers unite about the middle of the Great Valley, and flowing westward empty into Suisun, San Pablo and San Francisco Bays, and through these, by way of the "Golden Gate," into the Pacific Ocean. The latter forms a "break" in the Coast Range, which is an important factor in the climatic conditions of the Great Valley, in that it allows the influence of the sea winds to gain access to the interior. Thus every afternoon in summer the heat of the Great Valley (as well as that of the coast valleys), is tempered by the sea breeze, which blows up-stream (and therefore in opposite directions) in the Sacramento and San Joaquin Valleys, respectively. This, together with the dryness of the atmosphere, renders easily endurable temperatures much higher than could be safely faced in the East without imminent danger of sunstroke, which in California is as rare as are thunderstorms.

The Great Valley is terminated at the south by the Tehachapi Mountains, which unite the Sierra Nevada and the Coast Range. The Tehachapi Mountains form the boundary between "Northern" and "Southern" California.

In this section is the so-called Mojave Desert, a wide stretch of largely cultivatable and fertile plateau, which needs only water to transform it into a garden producing almost all products of the temperate zone. In its level portion the natural rainfall is only from four to six inches (in some years it is practically nothing), so it can hardly be taken into consideration in cultural practice. The main source of water supply for irrigation is from artesian wells. A large portion of the Colorado Desert is also cultivatable, needing only water to make it productive.

Winds.—As already indicated, the winds in California are on the whole very regular, being governed chiefly by the southwest trade winds blowing from the Pacific landward.

The moisture they bring is to a large extent condensed into fog by the cool waters of the Alaska current, and these fogs produce a very cool summer climate along the immediate coast. This is exemplified at San Francisco and on the adjacent bay coast generally, where the average temperature of winter and summer differ only about four degrees F.; so that in midsummer (July and August) overcoats and occasional fires are in request. In summer, as the hot air in the Great Valley rises, the cool air from the sea rushes in; but the fog cannot pass the crests of the coast ranges, and dissolves before the hot, dry air of the interior. During the winter the fog not infrequently covers the Great Valley for weeks at a time.

In winter the winds are more variable; the rain storms are ushered in and accompanied by south winds, which are commonly first observed on Puget Sound, and thence work southwards. They usually last about three days. East winds are rare, but sometimes occur in winter, and blowing as they do then from the snowy Sierra, are very chilly. North winds are always dry, and in summer resemble the sirocco of the Mediterranean region; on the coast they usually last from one to three days only, occurring chiefly in June and September, but are almost entirely absent in some years. At times they injure the crops seriously in the interior of the State, by drying out the land; on the natural pastures they dry out the grasses into standing hay, which serves for dry pasture throughout the summer.

The Rainfall.—In California, south of Cape Mendocino and north of the Tehachapi Mountains, practically all the rain falls during the seven months between November and May ("Franciscan climate"); the whole system of agriculture is so adapted to this régime that any deviation is unacceptable. A five-months' drought is therefore nothing extraordinary in California. "A green winter and a brown summer" is the normal condition here. It is evident that if the rainfall of twenty inches were distributed throughout the year (as is actually the case in middle Montana), it would be insufficient for the growth of ordinary field crops. But being concentrated within seven months (the "growing season"), with a very mild winter, cereals may be sown from November until March, and may be cut for hay or grain, as the season may render expedient. For it will readily be seen that meadows cannot be maintained in such a climate without constant irrigation; hence hay is made from cereals (wheat and barley), as well as from alfalfa, the latter serving also for pasturage in place of red clover.

A glance at the accompanying map shows wide variations of rainfall within the State, and even within the Great Valley. The table below shows, in an interesting manner, the variation on the east side of the valley from north to south.

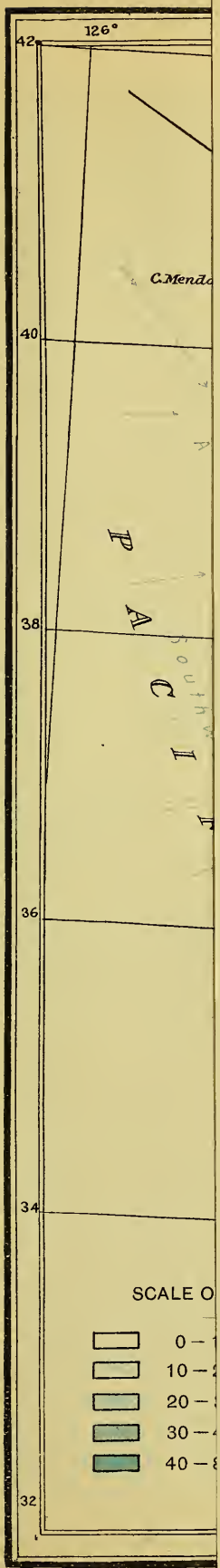
TABLE OF RAINFALL ON THE EAST SIDE OF THE GREAT VALLEY OF CALIFORNIA.

Station.	Inches.	Station.	Inches.
Redding	34.6	Lathrop	11.9
Red Bluff	23.8	Modesto	9.6
Chico	20.9	Merced	10.3
Nicolaus	18 6	Fresno	9.0
Sacramento	19.8	Tulare	7.0
Galt	16.7	Bakersfield	6.1
Stockton	13.2		

A similar, but less striking, decrease of rainfall (about four inches) is observed in an easterly and westerly direction, from the foot of the Sierra toward the Coast Range.

Twenty inches of rainfall is usually considered the limit below which the culture of field crops without irrigation becomes precarious. This is true where that rainfall is distributed all over the year; but in the "Franciscan climate," where it is concentrated upon six or seven months, during which plant growth is allowed by the temperature, much smaller rainfalls will suffice. It will be seen from the above table that the precipitation in the Sacramento Valley lies mostly above the twenty-inch limit; but as we proceed southward in the San Joaquin Valley, irrigation becomes more and more important, the water required being brought in from the streams descending from the Sierra. Yet the great depth of the soils and natural moisture rising from below, permits of successful grain culture far to the south of the twenty-inch limit.

A similar, but less rapid decrease, of rainfall is observed along the seacoast. Cape Mendocino is a kind of weather divide, north of which the rainfall and the summer climate


126°
42
C. Mendo
40
38
36
34
32
SCALE O
0 —
10 —
20 —
30 —
40 —


RAINFALL MAP
OF
CALIFORNIA
COMPILED BY
E. W. HILGARD
FOR THE
BERLIN GEOGRAPHICAL SOCIETY
CALIFORNIA
Area of the State in square miles 157,000
" " " in acres 100,000,000
Arable area in acres 35,000,000
Population 1,600,000
SCALE OF RAINFALL.
0 – 10 Inches.
10 – 20 "
20 – 30 "
30 – 40 "
40 – 80 "
PACIFIC OCEAN
SAN FRANCISCO
Eureka
C. Mendocino
Red Bluff
Oroville
Marysville
Sacramento
Ukiah
Pt. Arena
Clear L.
Santa Rosa
Napa
Pt. Reyes
Golden Gate
Oakland
Alameda
Stockton
San Jose
Santa Cruz
Bay of Monterey
Monterey
Cypress Pt.
Merced
Fresno
Visalia
Tulare
Tulare Lake
Bakersfield
San Luis Obispo
Pt. Concepcion
Santa Barbara
Santa Barbara Ch.
San Miguel
Santa Rosa
Santa Cruz
Santa Barbara
Begg's Rock
Santa Catalina
San Clemente
Los Angeles
Anaheim
Riverside
San Bernardino
Indio
Colorado Desert
North San Diego
Yuma
Rio Gila
Colorado R.
Mojave Desert
Death Valley
Owens Lake
Mono Lake
Bridgeport
Walker Lake
Carson L.
Virginia City
Reno
Susanville
Honey L.
Eagle L.
Madeline Plains
Lava Beds
Little Klamath L.
Shell
Wright L.
Goose Lake
Upper L.
Middle L.
Alturas
Mt. Shasta
Klamath River
Pitt River
Shasta
Humboldt L.
Humboldt Sink
Nevada City
Yuba City
Auburn
Placerville
Jackson
Lake Tahoe
Lake Bigler
Yosemite Valley
Owens River
Kings R.
San Joaquin R.
Tehachapi Mts.
Mojave
Providence Mts.
Pah Ute Mts.
Kingman
Needles
Fort Mohave
Fort Yuma
Fort Mojave
Fort Tejon
Fort Point
Alcatraz I.
Angel I.
Farallones
Santa Rosa I.
Santa Barbara I.
Santa Catalina I.
San Clemente I.
San Nicolas I.
Coast Range
Sierra Nevada
Cascade Range
Klamath Mts.
Scott's Mts.
Siskiyou Mts.
Shasta Mts.
Trinity Mts.
Bear River
Feather River
Yuba R.
American R.
Stanislaus R.
Tuolumne R.
Merced R.
Pajaro R.
Salinas R.
Santa Ana R.
Santa Clara R.
Santa Inez R.
Mohave River
Gila R.
Williamson R.
Sweetwater R.
Paramint Range
Panamint Valley
Death Valley
Owens River
Kings R.
Colorado R.
Rio Gila
Yuma
Indio
Colorado Desert
Mojave Desert
Death Valley
Owens Lake
Mono Lake
Bridgeport
Walker Lake
Carson L.
Virginia City
Reno
Susanville
Honey L.
Eagle L.
Madeline Plains
Lava Beds
Little Klamath L.
Shell
Wright L.
Goose Lake
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Klamath River
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Shasta
Humboldt L.
Humboldt Sink
Nevada City
Yuba City
Auburn
Placerville
Jackson
Lake Tahoe
Lake Bigler
Yosemite Valley
Owens River
Kings R.
San Joaquin R.
Tehachapi Mts.
Mojave
Providence Mts.
Pah Ute Mts.
Kingman
Needles
Fort Mohave
Fort Yuma
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Scott's Mts.
Siskiyou Mts.
Shasta Mts.
Trinity Mts.
Bear River
Feather River
Yuba R.
American R.
Stanislaus R.
Tuolumne R.
Merced R.
Pajaro R.
Salinas R.
Santa Ana R.
Santa Clara R.
Santa Inez R.
Mohave River
Gila R.
Williamson R.
Sweetwater R.
Paramint Range
Panamint Valley
Death Valley
Owens River
Kings R.
Colorado R.
Rio Gila
Yuma
Indio
Colorado Desert
Mojave Desert
42
40
38
36
34
32
126°
124°
122°
120°
118°
116°
114°

changes, Northwestern California having a climate with summer rains, much like that of Oregon. Owing to this fact and, farther south, to the prevalence of coolness and summer fogs, which contribute materially to the maintenance of summer vegetation, the coast region is eminently adapted to dairying, and especially southward of Santa Barbara, produces abundantly the staple crops of the northern States—together with beans, corn, and hogs. On this southern coast belt the rainfall ranges from about sixteen inches at Santa Barbara to eleven at San Diego; at San Francisco it is from twenty-three to twenty-four inches, then to northward rises rapidly to over forty inches, with occasional local variations down to thirty; but still, within the State, it rises at some points to as much as eighty inches, under the influence of the mountains.

The shape and direction of the coast valleys also exert a material influence upon both rainfall and temperature, according to the greater or less ease with which the trade winds can penetrate. Thus there are brought about numerous "local climates" and "thermal belts," favoring certain cultures more than others. Hence the selection of location and exposures is of exceptional importance in this State.

In the Sierra the rainfall increases about one inch for every 100 feet of elevation; aside from this the climatic and agricultural character of the foothills up to 2000–2500 feet is about the same as in the Great Valley. Farther up, to about 3500–4000 feet (according to latitude), fine deciduous fruit is grown, especially wine-grapes, peaches, pears, and apples, of excellent quality. Higher up, lumbering, mining, and sheep herding predominate.

Temperature.—The subjoined table is of interest in showing strikingly the differences already referred to, between the climates of the coast of California and of the corresponding latitudes on the Atlantic coast:—

CALIFORNIA COAST.				ATLANTIC COAST.			
STATIONS.	SUMMER.	WINTER.	YEAR.	STATIONS.	SUMMER.	WINTER.	YEAR.
Camp Lincoln	59.5	47.2	53.9	Boston, Mass.	68.7	28.1	48.4
San Francisco	58.0	50.1	55.2	Cape Charles, Va . .	74.3	35.8	56.0
San Diego	69.7	54.1	62.1	Edisto, S. Carolina . .	81.0	46.6	64.3

It will be noted, that while the *annual* averages of corresponding points on the two coasts are not very widely different, the temperatures of summer and winter are very much farther apart on the eastern coast than on the western, and quite as strikingly so in the northern as in the southern portions of the respective regions. This exemption from extremes of temperature constitutes one of the great attractions of the Pacific Coast.

In the interior, notably in the Great Valley, the seasons show somewhat greater extremes of temperature; but the greater seasonal range of the thermometer is largely offset by the fact that the dryness of the air renders the changes much less sensible than is the case in the moister air of the coast. Thus at San Francisco, which presents the extreme of the coast climate on account of its peninsular position, those familiar with the climate make a careful distinction between the sunny and shady sides of the streets in walking; bay-windows, of necessity, take the place of porticos or porches, which would rarely be available; while in the interior, porticos are universal, and camping out under a tree all night may be indulged in with impunity by anyone during the dry season.

In the Great Valley the summer temperature reaches daily from eighty to ninety-five degrees, and annually ranges above one hundred degrees from time to time. But here also, on account of the great dryness of the atmosphere, these temperatures are not at all oppressive, and as already stated, sunstroke is almost unknown. Naturally, out of reach of the sea influence, the difference between the summer average and winter average is much greater than on the coast, so that the temperature sometimes falls below the freezing point every night for several weeks; and it is remarkable (undoubtedly owing to the high mountains in the southern portion) that the minimum temperatures of the northern and southern ends of the valley are about the same. Sometimes snow falls for a short time, but it is soon melted, and a light crust of frozen ground is never exceeded. As the extreme limit of winter cold determines the agricultural possibilities of a region

much more than the average temperature does, the culture of the citrus fruits thus extends nearly to the northern end of the Sacramento Valley, as well as up into the foothills of the Sierra. Southward, in the San Joaquin Valley, one of the most promising orange-growing regions is located on the eastern edge of the valley, while farther south, in the Kern River Valley, the deciduous fruits gain preference.

In Southern California the heat, as well as the cold, is comparatively milder; on the coast the fogs are not so frequent or so heavy, as the Alaska Current turns away from the land at Point Conception, near Santa Barbara. On account of this equableness of the temperature, a variety of semitropic fruits is grown most safely in this part of the State. They include in favorable locations, besides the orange and lemon, the banana, pineapple, custard apple (Cherimoya), guava, papaya, and others. The irrigation water required almost throughout this region is supplied by the snows on the high crests of the Sierra Madre, which at numerous points is also gathered into reservoirs counting among the largest in the United States.

Taken as a whole, California corresponds in its climatic features and adaptation to the Mediterranean region of Europe and Africa—a grand *Riviera*, with a partial background of the desert as well, where the date palm and the ostrich find a congenial home, and alluvial plains equaling in richness the famed delta of the Nile.

E. W. Hilgard

THE SCENERY OF CALIFORNIA.

By John Muir.

At first sight of the fashionable scenery habit, it would seem that the people of the East need not come West seeking fine scenery, for they have plenty of it at home. God never made an ugly landscape. All that the sun shines on is beautiful, as long as it is wild; and much in every landscape is unchangeably wild, especially light, which falls everywhere. In no place on all this continent, from Florida to the Arctic Ocean, have I seen finer, diviner, more enchanting landscapes than in the Great American Desert, with its broad, hot, alkaline levels, and mountains and hills rising farther and farther beyond each other in smooth, billowy ranges, robed in light as a garment. And so the lover of nature, wandering at will or remaining steadfast like a rock, is always content with the fullness of beauty about him in any wild place, wherever he may chance to be. Every heaven-born want of scenery is satisfied, and there is no aching void to excite longing or curiosity concerning any other country or star.

To the sane and healthy, therefore, it seems hardly worth while to compare the scenery of the two sides of our continent. Each has its own beauty, like the two sides of a rainbow; but to defrauded toilers, grown dull and blind in duty and business, the need is different. Like sick children who can no longer eat bread or recognize their own mothers, the wearied workers of civilization, weak and giddy in the whirl of cities, stupefied by doing good and making money, recreation for body and soul is found only in what is novel. Their own beautiful and enchanting scenery no longer nourishes them. Their thousand miles of coast, with marvelous wealth of picturesque bays and headlands, kept in perpetual song and bloom of foam and spray by the waves of the blue Atlantic; the charming round-headed trees—oaks and elms, hickory and ilex, tulip and magnolia, fringed with rhododendron and sassafras, stretching in lovely forests along the flowing folds of the Alleghanies; the spiry spruce and pine woods of New England, with countless lakes and streams shining like silvery embroidery; the woods of the Middle West, the richest in species in the world, and the grassy plains and prairies, and chain of great lakes—all these, good enough for gods or men, at length become of noneffect. Seen so often through clouds of care and the stupor of business, they at length are not seen at all, and

GLIMPSES OF YOSEMITE VALLEY.

something tremendously striking is required to shake and frighten them out of apathy to life.

Of such awakening scenery there is abundance in the West—the wild dance of waters on the top of the Rocky Mountains in the Yellowstone Park; inverted waterfalls rushing up into the sky instead of falling out of it; the Yosemite streams descending from the sky with beauty and song fit to awaken the dead; lofty mountains, pure as heaven, preaching forever; the plunge of icebergs from the great glaciers of Alaska, and majestic sequoias that have looked down through all the centuries since Christ walked the earth. Forests, mountains, and plains, wild gardens fair as Eden, and crystal caves, our Golden State has in endless variety and abundance, to heal and cheer and revive the sick and weary of every land.

The immediate coast of California, though by no means lacking in interest, is much less broken and picturesque than that of the Atlantic. Excepting the unrivaled bay and harbor of San Francisco and the Bay of San Pedro, there are few marked openings. The shore bluffs rise abruptly from the waves, forming a wall apparently unbroken, gray along the front, green and yellow on the top. Going ashore we find few smooth reaches where one may saunter, or meadows, save the brown and purple meadows of the sea, full of slippery kelp and dulse, where seals and fishes feed, swashed and swirled in the restless breakers. The abruptness of the shore allows the massive waves that have come from afar over the broad Pacific to get close to the bluffs before they break, and the thundering shocks shake them to their foundations. No calm comes to these shores. Even in the calmest weather, when the sails of the ships hang loose against the masts, there is always a wreath of foam at the feet of the cliffs. The waves are ever in bloom, and crystal brine is ever in the air.

The scenery of California is composed on a much grander scale than that of the East. Go where you may, mountains are ever in sight, making every landscape striking and bold. Yet so simple and massive is the topography in general views, the main central portion of the State displays only one valley and two chains of mountains, which seem perfectly regular in trend; the Coast Range on the west, the Sierra Nevada on the east. These two ranges come together in wide curves, and thus inclose a magnificent basin, with a level floor more than 400 miles long and from thirty-five to sixty miles wide. This is the Grand Central Valley of California, the waters of which have only one outlet to the sea—by the famous Golden Gate.

But with this general simplicity of features, there is great variety and complexity of detail. The Coast Range, rising as a green barrier against the ocean, is composed of innumerable forest-crowned spurs and ridges and rolling hills, which inclose small valleys, some looking out through long leafy vistas to the sea, others with scant foliage to the central valley, while a thousand others, still smaller, lie embosomed and concealed amid smooth, round-browed hills, dotted with wide-spreading oaks. But the crowning glory of the Coast Range is the redwood forest which extends along the western slope in a nearly continuous belt, from the Oregon boundary to Santa Cruz; and in sustained grandeur and closeness of growth surpasses all other forests in the world. Trees from ten to twenty feet in diameter and 300 feet high are not uncommon, and a few attain a height of 350 feet, and even 400, while the ground beneath these giants is a garden of ferns, rhododendrons and lilies. Only by its companion species, *Sequoia gigantea* of the Sierra Nevada, is this superb tree *(Sequoia sempervirens)* surpassed in size, if indeed it is surpassed. The *sempervirens* is certainly the taller of the two, the *gigantea* attains a greater girth and is more beautiful and noble in port. The redwood is restricted to the coast, the "Big Tree" to the Sierra, and both to California, excepting a few groves of redwood that extend beyond the boundary into Oregon.

Making your way eastward through the leafy mazes of the Coast Range forests to the summit of any of the inner peaks or passes opposite San Francisco, in the clear springtime of the year, you will find the grandest and most telling of all California landscapes outspread before you. At your feet lies the Great Central Valley, extending north and south farther than the eye can reach, one smooth, flowery, lake-like bed of fertile soil. Along its eastern margin rises the mighty Sierra Nevada, miles in height, and so gloriously colored and so luminous, it seems to be not clothed with light, but wholly composed of it like the wall of some celestial city. Along the top, and extending half way down or more, you see a pale pearl-gray belt of snow, and below this a belt of dark purple and blue,

marking the extension of the main forests, and along the base of the range a broad belt of rose-purple and yellow, where lie the miners' gold and the foothill ranches and gardens. The Sierra is about 500 miles long, seventy miles wide, and from 7000 to nearly 14,700 feet high. In general views like this one no mark of man is as yet visible, nor anything to suggest the richness of the life it cherishes, or the grandeur of its sculpture. None of its magnificent forested ridges seems to rise much above the general level. No great valley or lake or river is seen, or group of well-marked features of any kind as distinct pictures. Even the summit peaks clearly defined on the sky seem comparatively featureless. Nevertheless, glaciers are still at work on the snowy peaks, and thousands of lakes and meadows shine and bloom beneath them, and the whole majestic range is furrowed with cañons to a depth of from 2000 to 5000 feet, in which once flowed magnificent glaciers, and in which now flow and sing a band of beautiful rivers.

Though cut in granite and of such stupendous depth, these cañons are not raw, gloomy, jagged-walled gorges, savage and inaccessible. On the contrary, with rough passages here and there, they make delightful pathways for every walkable traveler, conducting from the fertile lowlands to the highest icy fountains. They are mountain streets, full of life and light, graded and sculptured by the ancient glaciers, and present throughout all their courses a rich variety of beautiful and attractive scenery, the most attractive ever yet discovered in the mountain ranges of the globe. In many places, especially in the middle region of the western flank, the main cañons widen into spacious valleys or parks, like artificial landscape gardens. The largest of these are called Yosemite valleys, only one of which is far-famed as yet. Beautiful groves and meadows and thickets of blooming bushes diversify their level floors, while their lofty, retiring walls, infinitely varied in form and sculpture, and springing abruptly into the sky, are fringed with ferns, delicate flowers of many species, and hardy oaks and evergreens, while rejoicing streams come down over their sunny brows in glorious array to join the tranquil river that flows through the middle of every Yosemite park. They are like immense halls or temples, lighted from above. Every rock seems to glow with life. Some lean back in sublime repose; others, absolutely vertical, or nearly so, for thousands of feet, advance their brows in thoughtful attitudes, giving welcome to storms and calms alike — types of permanence, yet ever associated with beauty of the frailest and most fleeting forms, as if into these sublime mountain mansions Nature had taken pains to gather her choicest treasures to draw her lovers into close, confiding communion with her.

Here, too, in the middle region of the range where the cañons are deepest are the grandest trees — the *Sequoia gigantea*, king of conifers, the noblest of a noble race; the majestic sugar and yellow pines, Douglas spruce, *libocedrus*, and silver firs, each a giant of its kind, assembled together in one and the same forest, surpassing all other coniferous forests in the world, both in number of species and in the beauty and size of its trees. The winds flow in melody through their colossal spires, and they are everywhere made yet more charmingly vocal with the songs of birds and falling water. Fragrant ceanothus and manzanita bushes of many species bloom beneath them, and lily gardens and meadows and damp ferny glens, compelling the admiration of every observer. Sweeping on over ridge and valley in glorious exuberance, these noble trees extend, a continuous belt, from end to end of the range, interrupted only by the sheer-walled cañons at intervals of about fifteen and twenty miles. Here the great, burly, brown and grizzly bears delight to roam, harmonizing with the brown-barked trees beneath which they feed. Deer also dwell here, and find food and shelter in the ceanothus tangles with a multitude of smaller people. Above this region of forest giants the trees grow smaller, until the utmost limit of the timber line is reached at a height of from 10,000 to 12,000 feet above the sea, where the dwarf pine is so lowly and hard pressed by wind and snow that you may easily walk over the top of its heath-like tangles, as if walking over a brushy meadow. Below the main forest belt the trees likewise diminish in size, frost and burning drought repressing and blasting alike.

The rose-purple zone along the base of the range comprehends nearly all the famous gold fields. Here it was that miners from nearly every country under the sun came in wild excitement to seek their fortunes. On the banks of every river, gulch, and ravine they have left their marks. Every gravel and bowlder bed has been desperately riddled and sifted over and over again. Since civilization began, no more violent storm of human energy ever fell on mountains. With stout faith they drew rivers out of their channels

onto the tops of the ridges or along their sides, and made them work in the mines like slaves; and thus they removed hills about as big as mountains and cast them into the sea. But the pick and shovel, once wielded with savage enthusiasm, have been mostly laid aside, and only quartz mining is now being carried on to any considerable extent.

The gold zone is a region of tawny foothills, roughened here and there with hardy bushes and oaks and outcropping masses of lichen-colored slates. In early spring, from February to April, it is a paradise of bees and blossoms. Refreshing rains then fall freely, the birds are busy about their nests, and the sunshine is balmy and delightful; but before the end of May all the landscape seems as if it had been baked in an oven, most of the herbaceous vegetation crumbles to dust beneath the foot, and the small stream channels are dry; the ground is covered with a network of cracks, while the snowy summits looming along the eastern horizon look hazy and tremulous through the burning glare.

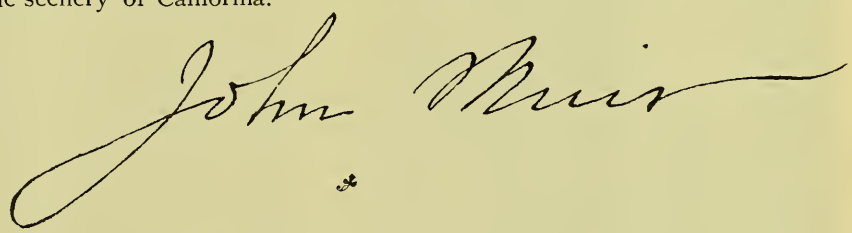
Every winter the high Sierra and the middle forest region get snow in abundance, and even the foothills and the central valley are at times whitened. Then the range looks like a vast beveled wall of purest marble, clean as the skies; and though silent in its flight from the clouds, and when it is taking its place on rock and tree and grassy meadow, how soon the gentle snow finds a voice! Slipping from the heights, gathering in avalanches, it booms and roars like thunder, and makes a glorious show, arrayed in long, silken streamers, and wreathing, swirling films of crystal dust.

The north half of the Sierra is mostly covered with floods of lava, and dotted with volcanoes in various stages of decay. The south half is composed of granite nearly from base to summit, while a considerable number of peaks in the middle of the range are capped with metamorphic slates. Mt. Whitney, the culminating point of the range, lifts its helmet-shaped crest to a height of nearly 14,600 feet, near the southern extremity. Mt. Shasta, a colossal volcanic cone, rises near the northern extremity of the range to a height of 14,440 feet, and forms a noble landmark for the surrounding country within a radius of a hundred miles. Residual masses of volcanic rocks occur throughout most of the granitic southern portion, and there are a considerable number of old volcanoes on the east flank, near Mono Lake and southward. Here, also, there are numerous hot springs and mud volcanoes; but it is only to the northward that the entire range is mantled with lava. From the summit of Mt. Whitney only granite is seen. Many nameless peaks and spires, but little lower than its own storm-beaten crags, rise in groups like forest trees, segregated by chasms and cañons of tremendous depth and ruggedness; but on Shasta nearly every feature in the view speaks of the old volcanic fires. Craters and cones of every size are seen, the highest being Lassen Butte, rising to a height of about 11,000 feet above the sea. The Cinder Cone near Lassen Butte marks the most recent volcanic eruption in the Sierra. It is a symmetrical truncated cone, about 700 feet high above its base, covered with gray cinders and ashes, and has a regular crater in its summit, in which a few small pines are growing. These trees show that the age of the cone is not less than a hundred years, though it looks fresh and unwasted. It stands between two lakes, which before the eruption were one. Before the cone was built a stream of rough vesicular lava was poured into the lake, cutting it in two, and then advancing into the adjacent forest, overwhelmed the trees in its path, the charred ends of some of which being still visible, projecting from beneath the snout of the lava stream where it came to rest. Later there was an eruption of ashes and loose obsidian cinders, probably from the same vent, which, besides building the Cinder Cone, covered the ground in the surrounding woods for miles to a depth of from six inches to several feet. The history of this last volcanic eruption is also preserved in the traditions of the Pitt River Indians. They tell of a time of darkness, when the sky was black with ashes and smoke that came out of the ground and threatened every living thing with death, and that when at length the sun again appeared it was red like blood. Less recent craters in great numbers roughen the adjacent region, some of them with lakes in their throats, others with trees and flowers, Nature in these old hearths and firesides having literally given beauty for ashes.

Along the base of the range a telling series of sedimentary rocks are now being studied, which contain much of its early history; but leaving for the present these first chapters, we see that only a very short geological time ago a vast deluge of molten rocks poured from many a crater and chasm on the flanks and along the summit of the range, filling river channels and lake basins, and obliterating nearly every existing feature on the northern portion. At length, when these broad lava floods ceased to flow, but while the

great volcanic cones built up along the axis still burned and smoked, the whole Sierra passed under the domain of snow and ice. Then over the bald, featureless, fire-blackened mountains, glaciers began to crawl, covering them from the summits to the sea with a mantle of ice, and then, with infinite deliberation, the work went on of sculpturing the range over again and making new scenery. These mighty agents of erosion crushed and ground the flinty lavas and granites beneath their crystal folds, working on through unnumbered centuries, until in the fullness of time the mighty Sierra was born again, brought to light nearly as we behold it to-day, with its glaciers and snow-crushed pines at the top of the range, wheat fields and orange groves at the foot of it. This change from icy darkness and death to life and beauty was slow as we count time, and is still going on over all the world wherever glaciers exist; but in no country, as far as I know, may these majestic changes be studied to better advantage than in this land of sunshine. Towards the close of the Glacial Period in California, when the snow clouds became less fertile and the waste from sunheat greater, the lower folds of the ice-sheet, discharging fleets of icebergs into the sea, began to grow shallow and recede from the lowlands, and then more slowly up the flanks of the Sierra, in compliance with changes of climate. The great white mantle of ice on the mountains at length broke up into a series of glaciers, more or less river-like, with many tributaries, and these again were melted and divided into still smaller glaciers, until now only about sixty-five of the smallest of the grand system are left on the cool, northern slopes of the snowiest peaks. Plants and animals, biding their time, followed the withdrawing ice, bestowing quick animation on the new-born landscapes. Pine trees marched up the snow-warmed moraines in long, hopeful files; brown-spiked sedges fringed the shores of the young lakes; new rivers roared in the cañons; flowers bloomed around the feet of the great burnished domes; while mellow beds of soil, broadly outspread, furnished food to multitudes of Nature's waiting, hungry children, great and small—squirrels, marmots, deer, bears, elephants, and birds, etc. The warm ground burst into bloom, and the green, aspiring groves were haunted by songful birds; and life in every form grew richer and happier and more beautiful as the eventful years passed away over the land so lately suggestive of only consummate desolation.

And now man has come with science and religion, arts and crafts, preaching, plowing, planting, building. Farms and towns, with homes and factories, churches and schools, parks and gardens, are spreading over the fertile lowlands, and wildness is going away. The dawn of a new day is breaking. Like the features of a landscape emerging from floods of fire and ice, the mountain tops of civilization, rather barren as yet, are rising over ignorance and vice, to develop, we hope, as harmoniously in accordance with divine law as did the noble scenery of California.

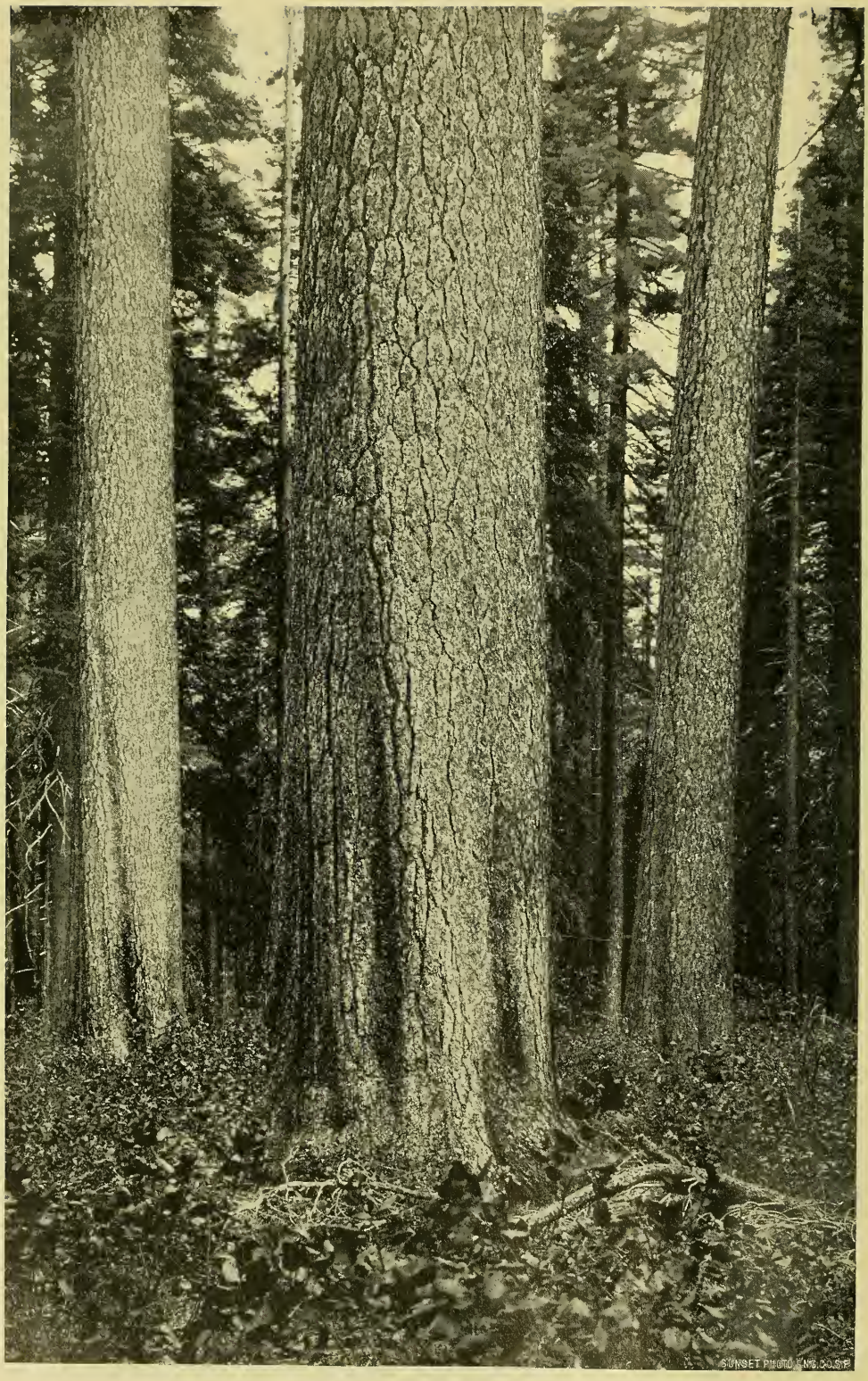


CALIFORNIAN FORESTS.

By Charles Howard Shinn.

SUPREME among the glories of the Golden State are its immense coniferous forests. Wonderful also are its great groves of oak, madroño, laurel, and maple, and historic are its marvelous single trees, such as the Hooker oak, the Felton redwood, and the Grizzly Giant of Calaveras. Those who visit us, and fail to see these things, have not only missed a great pleasure, but have lost one of the clews to the nature of California and the Californians. Our mountains, our forests, and our horticulture are linked together in one vast alliance. If we can keep our superb forests as the orchards of the mountains, gathering the surplus timber crop there, as we gather the annual fruitage below, fruit-tree belt and forest-tree belt will meet, and every acre of our waste lands will finally become valuable.

For more than a hundred years botanists and foresters have been studying with ever-



A SUGAR-PINE FOREST, McCLOUD RIVER, CALIFORNIA.

increasing admiration the noble Californian species of trees. Luis Née, of the Malaspina Expedition in 1791, had the good fortune to find and name our sturdy evergreen valley oak, *Quercus agrifolia*, which Keith so loves to paint. Bluff ship-surgeon Menzies, poetic Adelbert Von Chamisso, sturdy Eschscholtz, Governor Wrangel, of the Russian Colony, and many another old-time wanderer, carried piecemeal reports of the Californian forests to Europe. At last, in 1825, staunch Davie Douglass, that notable Scotch botanist, began those adventurous pilgrimages, during which he collected nearly 500 species of plants in California, including many of the finest of the conifers. Then came Doctor Coulter, Thomas Nuttall, and other explorers of the closing decade of the Spanish-Californian period, followed by kindly C. C. Parry, Doctor Torrey, George Thurber, and other botanists of the Mexican Boundary and Pacific Railroads expeditions. Later, collectors for the Smithsonian Institution and various universities and the workers of the State Geological Survey, under Professor Whitney, covered the main features of the subject, so that, while changes in nomenclature have occurred, and still occur, hardly any new species of trees, excepting the beautiful *Picea Breweriana* of the Siskiyous, have been listed in the last decade.

The Pacific Coast forests contain fifty-three species of conifers, and twenty-seven or twenty-eight species of oaks, besides maples, ashes, walnuts, sycamores, madroños, buckeyes, laurels, alders, the giant dogwood (*Cornus Nuttalli*), and many lesser trees and shrubs. In the madroño (*Arbutus Menziesii*) we have by far the finest and largest species of the heath family in the world, and in the manzanitas we have another group of superb and indeed unique heaths. Among the conifers, also, our sequoias, our Monterey cypress, our California nutmeg (*Torreya Californica*), and many others have especial interest for botanists.

The forests and woodlands of California, at the time of the American Conquest, probably covered about 50,000 square miles, out of 158,000 square miles of total area, if we include, as we should, the oak-covered foothills. At the present time we certainly have much less, including all grades of firewood and lumber-producing forests, half of which has been cut over once, or is very difficult of access, or is composed of species of less commercial value than those heretofore used. Perhaps we have 15,000,000 acres of first-class forest lands. Of course, if one estimates by the easy method of multiplying the length and width of a mountain range, we get much larger results. The Sierra alone will then contain about 33,000,000 acres of forest, or over 52,000 square miles. But we must leave out of such calculations the high, barren peaks, the grass-grown openings, the vast areas which, though covered with luxuriant vegetation, are far from true forests. In this sense the Piedmont region, so sparsely sown with scrub oaks and brittle pines that the territory only furnishes fuel, and must draw upon other districts for the lumber supplies of its mines and towns, are not to be included in the 15,000,000 acres of real forests.

In truth California contains but two large bodies of valuable timber, both of which are chiefly coniferous. One, commonly known as the redwood belt, occupies a comparatively narrow strip of fog-swept mountains, deep cañons, and narrow valleys, near the ocean from Monterey Bay northwards to Oregon. It is divided into lesser forests, such as the redwoods of Santa Cruz, of Sonoma, of Mendocino, and of Humboldt, and its fame has been sung in every language.

Limited in area, the whole extent of the coast redwoods being only about 1,400,000 acres, some twenty per cent. of which has been cut, the most recent estimates are that 17,000,000,000 feet of lumber, board measure, remain in these redwoods, which will not last more than thirty or forty years, unless waste is checked. The demand for this beautiful and durable wood, the true Cedar of Lebanon for America, is greater each year, in every civilized country. Fortunately the redwood has such powers of reproduction from sprouts and from seeds that the present forests can easily be maintained for centuries to come. Nevertheless, like all forests, they must have intelligent care.

The astonishing size of single redwoods has often been described. Giants of sixteen, twenty, and even twenty-four feet in diameter, whose shafts rise 300 and 400 feet in the air, have been measured, and some of these still stand in easily accessible situations. Single trees have been known to yield 300,000 feet of first-class merchantable lumber, even with the ordinary waste of our Californian mills. On Russian River Mr. Guerne cut 24,000,000 feet of redwood from 160 acres of land, but this was undoubtedly one of the best quarter-sections in California. The redwood forests would probably average from 30,000 to

50,000 feet per acre, and this is beyond the average yield of any other forest lands on record.

Everywhere this great Coast Range forest, whose chief grandeur comes from the redwoods, has other notable features, often overlooked in descriptions. Its pines, spruces, and many other conifers besides redwoods, are sufficient in themselves to give it a reputation. Its magnificent tanbark and chestnut oaks; its mountain maples, white-barked as Eastern birches; its broad-branched buckeyes, million-flowered in April; its scarlet-limbed, graceful madroño woodlands, the marvel of a continent, more glowing than Louisianian magnolias; its white and golden azaleas, so wild-wood sweet, and all its miles of warm, rich hollows and heights, bloom-burdened month after month,—these, and a thousand other elements, help to make up the deftly-welded charm of the land of the coast sequoia.

Inland and north, are the subdivisions of the fir and pine region, larger and more varied than that of the Coast Range, and chiefly belonging to the Sierra Nevada. It lies along the axis of this supreme mountain range, from Kern to Shasta, and about the inland peaks of the northern Coast Range. Its noblest trees are the *Pinus Lambertiana*, or sugar-pine; the *Pinus ponderosa*, the great yellow pine of California; *Picea nobilis*, *Picea amabilis*, and the giant white cedar (*Libocedrus decurrens*). Nowhere can this forest be studied to better advantage than in the Shasta and Siskiyou regions, readily reached by every tourist. The visitor to Lake Tahoe, Yosemite, and the Calaveras Grove also sees something of the Sierra forests, and comes within their charm, so different from that of the coast redwood forests, and yet in the end even more powerful and permanent.

Botanists divide the great Sierra forests into three belts, depending upon species and altitude. On the lower, or foothill belt, grow the oaks and *Pinus Sabiniana*. As previously noted, the 6500 square miles of this region, extending to an altitude of 2000 feet above the sea, is of more value for orchards and vineyards than for timber. The middle forest zone reaches to an altitude of 4000 feet, with an average width of fifteen miles. Here are fine but fewer oaks; here the great yellow pine appears, often 200 feet in height and girthing twenty or twenty-five feet. Here are the black pine, the red and yellow firs, the fragrant Sierra cedar, and some sugar-pines. The third forest zone lies above 4000 feet, extending to eight or nine thousand feet above the sea, and forms the grandest mass of varied coniferous forest known to civilization. The yellow and the sugar-pines, the giant firs, spruces, and sequoias rule here supreme. Above 9000 feet Alpine species of pines and junipers carry the fringes of the forest to the snow-line. Among all these noble conifers the sugar-pine (*Pinus Lambertiana*) is easily the first. Single specimens have been measured that were 300 feet high and forty feet in circumference. Douglass measured one fallen trunk whose circumference was fifty-eight feet. But this most valuable timber tree of the Sierra does not easily reproduce itself, is subject to many enemies, and is rapidly disappearing.

The most heavily-wooded portion of the Sierra forests, aside from the districts around Mount Shasta, are mainly in rough, mountainous country, and in most cases are difficult of access. I have now spent almost all of my vacations for four years in the Californian forests, studying their history and present conditions. It is hard to explain to those who have not spent months in the high Sierra, or Coast Range, the immense reproductive powers of our coniferous forests when given a chance, and also the absolute necessity of some protection. Take the Placer and Nevada districts of the Sierra as an illustration. The forest problems in this district, which is one of the highways along which cattle and sheep are driven into the fastnesses of the Sierra and back into the valleys, are assuredly as difficult and numerous as those of any other part of California. If the leading species will reproduce themselves here, or if some species are gaining foothold, or if a little care and attention would enable the young trees to overcome all obstacles, it seems certain that immense areas in the Sierra elsewhere could also be reforested. The enemies of the forest here are,—first, the sheep; second, the cattle; third, the old trees which die, and felled by the winter storms, break down hundreds of the younger trees; lastly, the fires.

Proper conditions of moisture are the prime governing facts which decide the occurrence of timbered lands. In the districts of California which require irrigation to produce the highest horticultural results, the timber belts therefore are narrow, bordering the streams and marking their courses. The large bodies of timber are all on the high mountain sides, usually descending toward the valleys on the northern or western slopes. The forests, or rather woodlands, of the valleys are generally but a scattered growth of trees like the oaks, adapted to resist drought. Unfortunately the timber is for the most part

useful only for firewood, though a few of the Californian hard woods are in demand for cabinet work.

The English oak is a much more rapid grower than any Californian species, and its timber is much more valuable; its planting is therefore to be recommended. The Oriental plane tree, often called European sycamore, and several of the eucalypts have been proved to thrive with little moisture, and even on light soils yield a large amount of firewood. The box elder, or *Negundo*, is a fast-growing, hardy tree, suitable for localities too frosty for any of the eucalypts. The plane before alluded to is one of the best alkali-resisting trees known to foresters. Several of the acacias rival the eucalypts in rapidity of growth and in withstanding drought, and seed so rapidly that they extend their own plantations. The lack of California being in the line of hard woods, it is advisable to plant on a large scale the ashes, especially those of North Africa, Asia, and Arizona, and the European species, which seem to be most rapid growers here; also the cork oak, English oak, and Turkey oak; also the *Eucalyptus rostrata*, the casuarinas, possibly the *Zelkowa Keaki*,—and in brief the best hard-wood species from districts of light and variable rainfall and of similar geological formation. Here, however, the rapid development of horticulture and the rapid increase of wealth indicate increasing demands for the finer classes of beautiful and durable finishing woods and for costly cases and packages. In time commercial forestry in California will cover a very wide range,—perhaps much greater than in Europe. Of course this is predicated upon the maintenance of the best of our present species. Even hard wood forests could not compensate us for the destruction of our coniferous trees.

Every visitor to the State, and every Californian, should take an intelligent interest in the work of the Forestry Division of the Department of Agriculture at Washington and of the Forestry Stations of the University of California, and should aid the friends of forestry in securing wise legislation and sufficient funds to carry on forestry experiments, to introduce valuable new species, to collect and publish useful information, and to educate the public respecting forestry work. Under proper guardianship and management the forest reservations of the Sierra will preserve for all time to come the great conifers of those districts. But there is immediate need of a Coast Range reservation in Northern California.

Charles H Shinn.

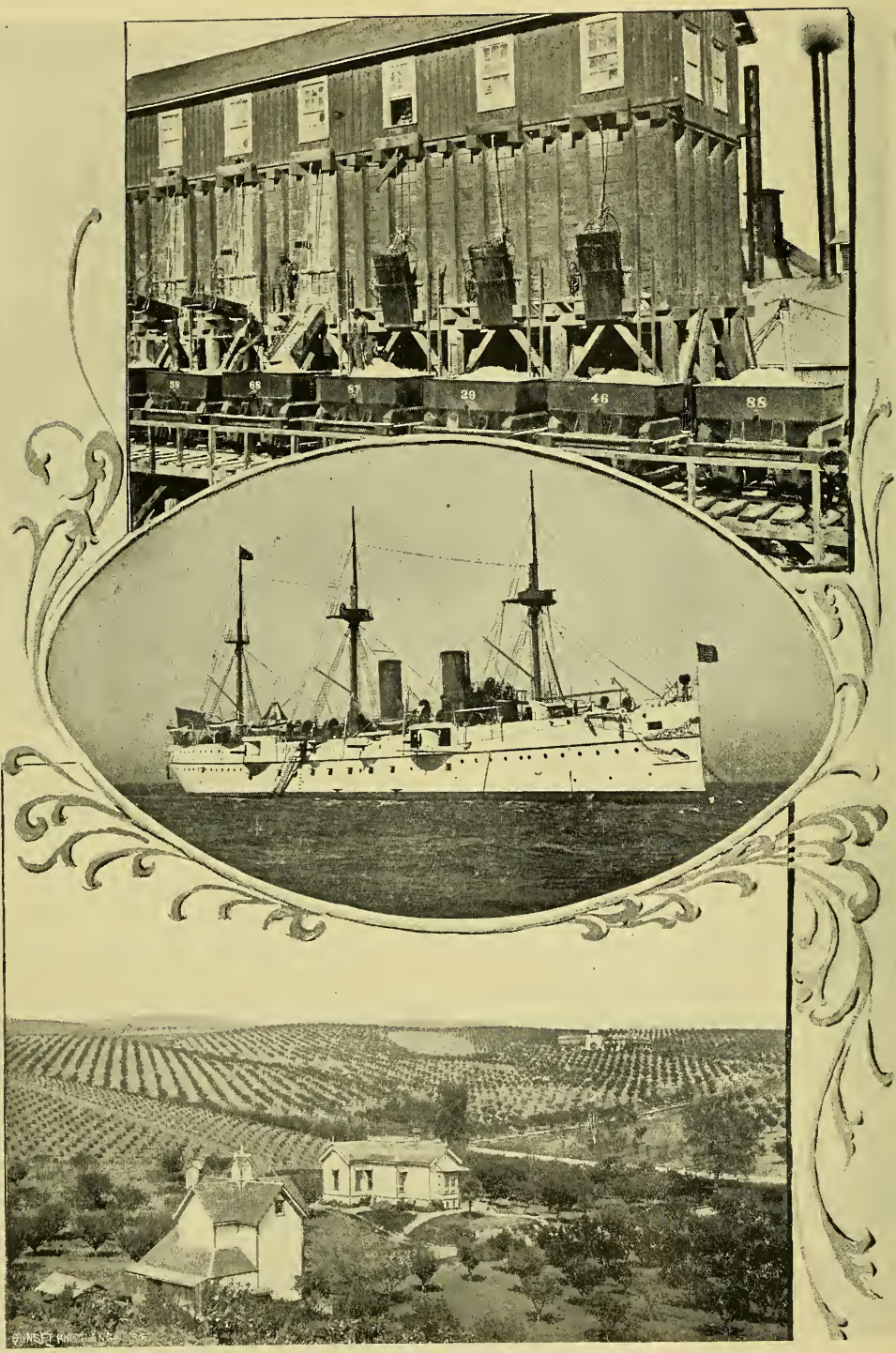
RESOURCES OF CALIFORNIA — CLIMATE, PRODUCTS, STATISTICS RELATING TO VARIOUS INDUSTRIES, ETC.

By General N. P. Chipman.
(President, and Chairman of Committee on Industrial Resources, California State Board of Trade.)

A GROUP of Eastern tourists gathered in the exhibition rooms of the State Board of Trade, and seeking information concerning the advantages of California, came to me as President of the organization, asking questions so pertinent and searching, that I have set them down here, with my effort at answering, believing that the colloquy thus reported may serve to benefit other inquirers, as well as my fellow-citizens of California.

Question.—We have come here to learn something in a general way as to California, with a view of future residence in your State; will you help us in our search for essential facts?

Answer.—Most cheerfully, so far as I can, in the brief time I can give you. Let us have a definition to begin with. The word "resources" (according to Webster) means:



A GROUP OF CALIFORNIA INDUSTRIES.
QUARTZ MINING — SHIP BUILDING — FRUIT GROWING.

"Capabilities of producing wealth, or to supply necessary wants; available means or capabilities of any kind." Assuming this definition, I will proceed. Our first and greatest resource is our climate.

Q.—Hold, a moment. We have heard a great deal about your climate, and it is certainly a most delightful one, but there are good climates elsewhere; how do you make out this to be a resource?

A.—Pardon me. Your question implies that you have, in common with many others, gained no conception of the economic advantages of our climate. You probably regard it, as most persons do, merely as contributing to the physical pleasures of living. You must admit that even this narrower view is something, for if other advantages were equal or nearly equal, you would prefer a home where there is least physical discomfort. First, you must know the extent of the country embraced within the zones of substantially the same favorable climatic influences. I am speaking from an economic standpoint, and not with reference to differences in the matter of personal comfort. This climate of which I speak is found from San Diego on the south to the State line on the North Pacific Coast, and to Redding in Shasta County in the Sacramento Valley, and includes practically every acre of land between the Sierra Nevada and the Pacific Ocean, below an altitude of from 1500 to 2000 feet. On the Atlantic Coast the parallels would reach from Boston, Mass., to Charleston, S. C. Latitude has but little to do with our climate. Along the coast the temperature is less variable and the extremes of heat and cold not so great, especially the heat, as in the interior valleys, but the temperature rarely falls below freezing anywhere, and then but a few degrees, and for a day or two. The interior valleys are warm in summer, and the compensation lies in the greater range of products and better facilities for curing the crops, than on the more humid and sometimes foggy coast.

Q.—You don't mean to say you can grow oranges and lemons and olives and other semi-tropical fruits in these northern latitudes, do you?

A.—Of course I do. Why should not the same climatic conditions produce like results? I see that you have imbibed the common misconception that prevails in the East about Northern California. Let me show you. Look on the map of California hanging there. You see the town of Oroville, in Butte County; it is 130 miles north of San Francisco, and 530 miles north of San Diego. Within a radius of fifteen miles around Oroville, there are many acres of orange and lemon groves in bearing, and producing as fine fruit as is grown in the State. Let me further illustrate the climate by the tree planting. In 1892 the State Board of Horticulture took a census of the fruit trees planted in the State up to that time. I will take the raisin, prune, olive, and fig as illustrations. Of the 82,222 acres of raisins, only 9382 acres were in Southern California; the single county of Fresno, in the San Joaquin Valley (pointing), had nearly five times as many acres as all Southern California. Of the 9228 acres of almonds, 728 acres were in the South. Of the olives then planted, more than half were in Northern California. In the same county of Butte there were nearly as many acres as were in Santa Barbara County, where Mr. Ellwood Cooper has made the State famous by his olive oil. Of the 49,626 acres of prunes, 42,392 acres were in Northern California, and more than half the fig trees. I mention this with no intention to make invidious comparisons of sections, but to show that tree planting is evidence of what I have been telling you.

Q.—We have had the impression that all the oranges were grown in the South, and all the prunes in Santa Clara Valley, and all the raisins in Fresno, and that your climate and soil were not universally adapted to all kinds of fruit. Is this not so?

A.—What I have just told you is evidence to the contrary. I will give you a table taken from my annual report of fruit shipments of 1896, given from terminal points. It will show you where the fruit came from, and I will also give you the comparative shipments for the last seven consecutive years. These tables will illustrate the growth of the industry in the State.

SHIPMENTS OF FRUIT OUT OF THE STATE BY RAIL IN 1896.

TONS OF 2000 POUNDS.

PLACE OF SHIPMENT.	GREEN DECIDUOUS	CITRUS.	DRIED.	RAISINS.	NUTS.	CANNED.	ALL KINDS.
NORTHERN CALIFORNIA.							
San Francisco	33.0	19.5	3,644.3	239.3	300.5	11,379.4	15,616.0
Oakland	2,436.1	....	377.0	....	97.1	3,119.1	6,029.3
San Jose	6,473.0	....	22,225.2	3.0	54.6	5,588.5	34,344 3
Stockton	6,798.1	379.5	9,038.3	30,533.0	86.8	1,560.5	48,396.2
Sacramento	36,013.6	50.4	5,076.3	271.1	510.3	4,409.0	46,330.7
Marysville	1,054.3	362.1	2,963.0	136.6	1.3	3,738.9	8,256.2
Total tons	52,808.1	811.5	43,324.1	31,183.0	1,050.6	29,795.4	158,972.7
Total carloads	5,280.8	81.1	4,332.4	3,118.3	105.0	2,979.5	15,897.2
SOUTHERN CALIFORNIA.							
Los Angeles	801.5	52,300.5	2,814.6	432.8	2,822.4	2,558.2	61,730.0
Orange County	552.0	7,020.0	348.0	200.0	1,030.0	30.1	9,180.1
Riverside County	12.0	23,484.0	72.0	287.0	....	....	23,855.0
San Bernardino County	2,484.0	13,476.0	972.0	900.0	20.0	299.4	18,151.4
San Diego County	.....	2,064.0	60.0	975.0	....	8.2	3,107.2
Total tons	3,849.5	98,344.5	4,266.6	2,794.8	3,872 4	2,895.9	116,023.7
Total carloads	384.9	9,834.4	426.6	279.4	387.2	289.5	11,602.3
Carloads from State	5,665.7	9,915.5	4,759.0	3,397.7	492.2	3,269.0	27,499.5
Carloads by sea	98.0	....	93.2	45.6	4 9	1,285.5	1,527.2
Total carloads by sea and rail	5 763.7	9,915.5	4,852.2	3,443.3	497.1	4,554.5	29,026.7
Total carloads of fruit by sea and rail	.....	.....	.....	.....	.....	.....	....

NOTE.—The railroad company reported all shipments from Southern California from the terminal point of Los Angeles. The several counties named do not, therefore, get full credit for shipments from their localities.

GENERAL SUMMARY AND COMPARATIVE TABLE OF SHIPMENTS BY RAIL AND BY SEA OF FRUITS, WINE, BRANDY, AND VEGETABLES FOR SEVEN CONSECUTIVE YEARS.

TONS OF 2000 POUNDS.

KINDS.	1890.	1891.	1892.	1893.	1894.	1895.	1896.
Green deciduous	34,042.0	50,548.9	59,374.5	80,112.3	90,692.2	66,254.8	57,638.3
Citrus fruits	34,209.6	46,921.4	34,857.5	80,757.0	58,964.0	115,825.5	99,156.0
Dried fruits	32,297.5	32,919.0	29,762.2	45,386.2	51,828.2	61,386.4	48,522.8
Raisins	20,560.1	22,779.1	26,673.4	37,409.9	46,954.4	46,390.1	34 434.6
Nuts	787.1	1,358.9	2,061.9	1,796.5	3,953.5	3,234.7	4,972.6
Canned fruits	40,060.9	32,395.0	55,273.7	31,626.3	60,352.6	41,395.5	45,546.9
Carloads fruits by rail and by sea	16,195.7	18,692.2	20,800.3	27,708.8	31,274.4	33,547.2	29,026.7
Carloads vegetables by rail	None reported.	None reported.	None reported.	6,978.4	4,276.6	3,613.6	1,130.6
Carloads vegetables by sea	None reported.	None reported.	None reported.	None reported.	410.0	40.0	487.7
Carloads wine and brandy by sea and rail	None reported.	4,765.1	4,832.5	6,620.9	7,663.5	8,056.8	7,609.0
Carloads fruit, vegetables, wine, and brandy by rail and sea	16,195.7	23,347.3	25,632.8	40,928.5	43,624.7	45 257.4	38,254.0

Now I want you to bear in mind that it is our climate that makes it possible for us to grow these semitropical fruits, and hence it is climate becomes a resource. How many months of profitable labor are given the farmers of the cold regions of the East and West? Yes, you are right; I should think six or eight at most. In California our climate makes it possible to profitably use every day in the year. We have no month when vegetation, in some form, is not growing. Our wonderful diversity of products gives constant employment in the field, garden, and orchard, and in all lines of manufactures the weather is always propitious. You may not believe it, but I can take you to a property one hundred miles north of Sacramento, where you will find growing in the open, in one large orchard

of 3000 acres,—apples, pears, cherries, prunes, plums, figs, oranges, lemons, almonds, raisins, apricots, olives, guavas, loquats, persimmons,—in short, every fruit to be found growing in Russia, France, Egypt, Greece, Spain, and in the entire Mediterranean basin. I doubt if a like expression of climatic possibilities can be found elsewhere on the globe. One other fact, and we may leave the matter of climate. California is a universal sanitarium. In the mountains and in the valleys everywhere, barring of course here and there local influences to the contrary, the climatic conditions promote improved health to all who come. Special conditions, more favorable, appear in different places, but generally all latitudes and all regions invigorate and build up the physical functions. Our great valleys lie parallel to our mountain ranges and the ocean, and residents find quick and easy change from one to the other; the people of the interior go to the coast or the mountains for a change, and the coast people go to the interior and mountains. A few hours bring this most delightful change.

Q.—You talk a great deal about the wonderful diversity of your products and resources; give us some idea of this. Some of us live where it is only possible to raise corn, and wheat, and oats.

A.—I hardly know how to convey an adequate conception of this feature of California life. I can only suggest it. Your intelligence and your own observation, if you will use your eyes and ears while here, will complete the picture. Our mountains and a large part of the north coast line are covered with commercial timber of high value and almost inexhaustible in quantity. We have sugar pine (similar to your white pine), yellow pine, almost the same, spruce, fir, and cedar in the Sierra and in parts of the high Coast Range. Along the coast, north of Santa Cruz, are the famous redwood forests. I have seen an estimate of the redwoods in Humboldt County alone, showing that her forests will yield two hundred million feet per annum for 250 years. The East must soon come to us for lumber. We now have a large trade in the South and Central American States and in the Australian Colonies. In these mountains of the Sierra and Coast Range are many delightful valleys, suitable for general farming and dairying, and outside the valleys our cattle and sheep find summer pasturage. These mountain ranges nearly throughout their length are charged with mineral veins, and deposits, and placers. If it were possible to exhibit a vertical section of the Sierra 3000 feet deep along the track of these lodes and beds of minerals, the most gorgeous picture would be presented ever exposed to human gaze. That portion of our population engaged in mining and administering to the immediate wants of the miners furnishes a market for the products of the valleys, and year by year the mining industry is growing and becoming more important. The annual output of gold alone is about $15,000,000.

Distributed among our foothills and in the mountains are valuable quarries of marble, granite, onyx, and other building and ornamental stones. Lying close neighbors to these inexhaustible riches, deposited when Nature was in her complaisant mood, are to be found here and there valuable beds of potter's clay, now being worked into all sorts of useful and ornamental forms, and in a few places are found sands of great value for the manufacture of glass.

In both the Coast Range and in the Sierra, at convenient distances apart, are distributed at all elevations (sometimes down to the valleys themselves), many very remarkable healing springs and never-ceasing, effervescing, mineralized waters, most delightful to the taste, and beneficial to the health. A large industry is springing up in the direction of an export trade for these waters.

Q.—You seem to be making much of a portion of your State we had supposed of no value. Your literature deals mainly with the valleys, and apologizes for a large proportion of waste country. Haven't you finished with the mountains?

A.—No; not quite. You are right about our not having given sufficient prominence to our mountain resources. I have only one or two more points to make, and then we will come down a few thousand feet—perhaps, you may think, out of the clouds. Let me assure you, I have not been chasing rainbows. We have at hand here in this exhibition hall confirmation of the great value of all these things I am talking about.

Look again at the map of California. Commence here in Shasta County, at the head of the Sacramento Valley. Do you see those streams marked on the map, taking their

rise in the Sierra Mountains? Run your eye along the mountain side, clear down to the Tehachapi Pass. You see the snake-like tracks on the map at short intervals, leading up to the mountain tops. These torrential streams have a fall, to the point where they debouch into the valleys, of about one hundred feet to the mile, by direct line, as the crow flies, or as an electric wire would run. There are lying dormant along these mountain slopes cheap and easily utilized forces, sufficient for all the mechanical power required to operate all the railroad trains, all the factories, all the agricultural appliances to which power can be applied, all the street car lines of our cities, and all the plants for lighting our streets and houses, and all this may be done without taking away any portion of the water needed for irrigating our valley lands—indeed, these mountains may supply all these important utilities by harmonious and complementary systems. Now do not think this Utopian. Go to Folsom, on the American River, and see what is being done there for the City of Sacramento, twenty-two miles away. Go to Antelope Creek in Tehama County, and see what is being done there for the town of Red Bluff, ten miles away. Go to Tripp's Mill on the Mokelumne River, and see the plants being completed by the Blue Lakes Company to transmit electrical power to Stockton, thirty miles distant, and to the miners of the mother lode in Calaveras, Amador, and Tuolumne counties. Go to the San Joaquin River and see the same phenomenon worked out for Fresno, thirty-five miles away and 1400 feet below, and after you have visited all the seats of these marvelous forces, go up the streams and see how many hundreds of times these forces may be utilized over and over again.

Q.—You astonish us with these startling revelations. We stopped at Sacramento and noticed that the street cars were operated by electrical power, and we saw at the railroad shops the same manifestations, but we did not suppose the vital force of it all came over a little wire no larger than the pencil you hold in your hand, and so far away, too. Certainly your mountains are a wonderful resource of your State, in the view you present, and as time rolls on there will be millions of people drawing from their exhaustless wealth. Have you finished yet?

A.—Not quite. One more resource I want to present, to which our mountains contribute grandly and nobly. I refer to the scenic beauty and grandeur of our combined mountain and valley landscape effects. Now this is getting away from the utilitarian view of life; but should we not do this when we can do so without sacrifice to the utilities of life? I look forward to the time—I shall not be here, but I shall witness it—when by reason largely of the unique, and harmonious, and surprisingly beautiful distribution of our natural scenery there will be developed here in California a race of men and women, in all the attributes which distinguish men and women from beasts and from each other, superior to any other to be found on this globe. No race of people can dwell permanently for many generations in the midst of such scenic glories without exaltation of character.

Q.—Pardon me. But we are reminded of one inexcusable omission among the resources you have here portrayed. We want to assure you that your incomparable and marvelous Yosemite has spread your fame wherever a lover of Nature is to be found. We all intend to go there, if nowhere else.

A.—Thank you for this just tribute to our Yosemite. Your concession in this concedes our whole case. And now a word as to the valleys. Here we find ourselves surrounded by conditions that make possible the most diversified agriculture anywhere to be found on the earth—the chief factor of which lies in our climate of which I have spoken. Let it be sugar-beet culture. The sugar campaign (why it is called a campaign I cannot imagine) in California is two or three months longer than it can be in Nebraska or Utah or Virginia—where there are factories now—or in any State with the same climatic conditions as in those States. We plant the seed here at a time when the ground is frozen fast and tight in Nebraska, and we run our factories long after the factories must shut down there. We grow more to the acre, and the beet has a greater per cent. of saccharine matter. In 1896 the output of our factories was 4750 tons, and other plants are in course of erection—one at Salinas is to be the largest in the world.

Let it be the cereals—wheat, oats, barley,—and we stand at the front rank.

Our vegetable gardens are producing something the year through. In 1893 we shipped out of the State 7000 carloads of vegetables, and shipments were made every month in the year. Among these were 1500 carloads of beans. The canned asparagus

of this State is famous on sea and land. We are building up a large trade for garden and flower seeds.

Our sheep and wool industry is important. Unlike the Pennsylvania and Ohio wool-growers, who are numerous but have small flocks, our growers are comparatively few, with large flocks. I have already referred to the method of feeding. There are individual owners of thirty and forty thousand head. They feed upon the grain stubble in early fall, but mainly subsist upon the wild grasses, and browse off the foothills and mountains.

We convert a large quantity of our wheat into flour for export, and have a large China trade.

The bee or honey industry is by no means insignificant. This product belongs with the orchard, and while the bee is extracting nectar from the blossoms, it is pollenizing them and making the fruitage more certain. I know of one ranch firm in Siskiyou County, engaged in cattle feeding from alfalfa, that realizes about $3000 annually, from bees that feed upon the bloom of the plant. In my own orchard I keep from thirty to forty stands of bees, and so might hundreds who do not.

Among our forage plants, alfalfa is chief, and a most valuable plant; it is yielding from five to ten tons per annum per acre. It requires irrigation for the most part, but our mountains, as we have seen, furnish the water.

Our hop fields yield from forty to fifty thousand bales per annum.

Our soil and climate are adapted to the growth of the valuable fibrous plants. Hemp and flax and ramie have established their value here and their adaptability to our soil and climate.

It is demonstrated that we can grow leaf tobacco for cigars more nearly equal in aroma to the Cuban article than has been produced elsewhere in this country.

Satisfactory experiments have been made with canaigre, from which tannin is extracted, and we find the variety of Australian wattle, or acacia, from which tannin is taken, is readily grown here.

The dairy interests are found along the coast and in the mountain valleys, and are quite extensive.

Our fruit-canning industry gives employment to many thousands of people — chiefly women and children. In 1894 the shipments out of the State exceeded 6000 carloads of ten tons each.

The average annual product of our Californian coast fisheries is about $5,000,000, and the annual whaling catch of the San Francisco fleet is not far from $1.000,000. Many varieties of food fishes from Eastern waters have been successfully planted in our rivers, and we can now buy shad for less price and for more months in the year than they can be obtained in Eastern markets. Eastern oysters have been transplanted here, and are promising to become acclimated and self-sustaining.

Shipbuilding must soon take on large proportions here. The shipbuilding yard of the Union Iron Works has added much to the fame and wealth of California.

Q.—Can you give us some idea of the growth of agriculture in California during the decade of 1880–1890, as shown by the census, and as compared with other States, and its relative rank?

A.—Yes; I have had occasion to do this before, and have some interesting figures at hand. I will arrange them in tabular form, and you can study them at your leisure.

FARM STATISTICS.

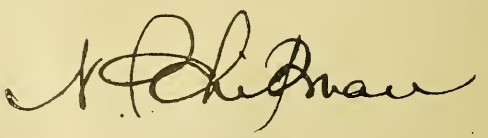
	IN CALIFORNIA.	IN THE UNITED STATES.
Increase in the Number of farms	47 per cent.	14 per cent.
Increase in farm acreage	29 " "	15 " "
Increase in value of lands, fences, and buildings on farms	166 " "	32 " "
Increase in value of property	88 " "	40 " "
Increase in value per capita	35 " "	19 " "
Increase in value of farm implements	74 " "	25 " "
Increase in value of live stock	70 " "	46 " "
Rank in total wealth		6th
Rank in population		22d
Rank in value of live stock		14th
Rank in number of sheep on ranches		1st
Rank in number of horses on farms		9th
Rank in value of farm products		10th
Rank in quantity of wheat grown		3d (1893)

Increase in wheat produced	41 per cent. (decade.)	1 per cent.
Of the entire wheat crop of the United States	9 " " (1890)	
Of total value of wheat exports	25 " " (remaining States, 75 per cent.)	
Of the total barley crop of the United States	22 " " (1890)	
Rank in quantity of hay of the United States		9th (1894)
Rank in quantity of hops of the United States		3d (1890)
Rank in quantity of wine of the United States		1st, or 6 per cent. of country's output.
Rank in dairy products		5th
Rank in wool		1st and 2d, never below 2d.
Farm products, increase	46 per cent. (decade.)	11 per cent. U. S.
Increase in manufactures	84 " " "	74 " " "

To resume my running description: Look out upon this noble bay of San Francisco, with an area of 450 square miles, and observe how limitless is its anchorage for the largest craft that floats. See that picturesque opening towards the ocean, known as the Golden Gate by every mariner since its discovery by Portala, and mark how ample and safe a gateway it is to the largest and most beautiful harbor in the world, and, withal, do not fail to notice how easily defended against an enemy is this refuge of safety for the world's shipping. This bay and its entrance were delivered to mankind in so perfect a condition, that our government has expended upon it only about $150,000. Look again at the map, and observe this long stretch of seacoast, and the numerous bays, inlets, roadsteads, harbors, estuaries, and other means of utilizing the great waterway of the Pacific. Stretch a line due east across the continent to the Atlantic, from Del Norte County, and another from San Diego, and notice the States enclosed between the parallels on the Atlantic Ocean—Massachusetts, Rhode Island, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina. Between the parallels on the Pacific lies California alone, the mistress of this great stretch of commercial seacoast. Take a steamer and go with me up the Sacramento River, over 300 miles by river, to the town of Red Bluff, the present head of navigation, you will have passed through an empire tributary to this noble water course. As you return, run up the San Joaquin River to the city of Stockton, the chief city of the San Joaquin Valley. If you care to speculate of the future, as I often do, tell me whether it will be long before water transportation will penetrate that valley as far as Buena Vista Lake, near Bakersfield. I do not speak of what man has done in the way of railroads, but of the resources with which Nature has endowed the State.

Q.—Excuse us for interrupting you; but really, we should ask no more of your time, and besides, we have learned enough to give us much to think about. Now, will you not tell us where, in this land so blessed by all that a lavish Providence could bestow—where would you advise us to make our homes when we return here to live?

A.—I cannot take that responsibility. Much depends upon the occupation to be pursued; upon the individual effort of the man himself; upon his likes and dislikes; upon advantages offered for education and the enjoyment of religious exercises; upon the moral tone of the particular neighborhood; upon the nativity of the people among whom you are to make your home, and a hundred other more or less important considerations that the homeseeker must decide for himself. You have presented the one great embarrassment in coming to California—to know where to select a home in this vast region of desirable country. The merit of Southern California is attested by the fact that the people once attracted there seldom go elsewhere, but are content to remain in that charming country. It is also true that the people coming into the North, and into what may be properly termed the Central portion of the State, pitch their tents there, and are content and happy. Further than this it would not be proper for me to go, as the official head of this Association that has given ten years in an impartial endeavor to make our State more widely known. I hope you will study the exemplars of our resources, spread before you here in our exhibit, and that your visit amongst us may result in your becoming citizens of our State.



IRRIGATING CANAL, KERN COUNTY.

IRRIGATION.

By C. E. Grunsky, C. E.

Number of irrigators in California	14,000	First cost of irrigation works over	$13,000,000
Irrigated area in acres, exceeds	1,000,000	Annual cost of water to irrigators nearly	2,000,000
Percentage of farms irrigated	26	Annual value of products of irrigated farms, about	20,000,000
Percentage of land farmed which is irrigated	18		

IRRIGATION is not a new art in California. More than one hundred years ago mission gardens and orchards were supplied with water brought long distances in ditches, and the wisdom of thus increasing and controlling the supply of water to the soil has been accepted without question in the southern portion of the State, and is gradually forcing recognition more to the northward.

But though California is famed for its irrigation works, easily ranking its sister States in the matter of expenditure for irrigation systems and area irrigated, still irrigation is not general throughout the State. It has been developed according to local conditions and requirements, and is a valuable supplement to the irregular, uncertain rainfall of the winter months. Above all things, it enables the intelligent farmer to regulate and control the growing period of his farm products, which are fully as dependent on an abundant supply of moisture as upon the sunshine which is so bountifully supplied to the State, and which without the aid of moisture parches our fields at the very time when plant growth should be most rank.

To irrigate, means to supply moisture artificially to the soil. Where this is done on a large scale, to stimulate the growth of forage plants, cereals, trees, or vines, the sprinkling can and garden hose, which the city resident is apt to associate with irrigation, are superseded by methods requiring less time and labor. Large volumes of water are brought under control, generally in open ditches or canals; sometimes, particularly when the supply is limited and correspondingly valuable, in closed conduits, such as large pipes of iron or wood. From the main canal water reaches branch ditches, which deliver it to the irrigating ditches of the individual farmers, and it is applied to the land in many different ways, varying according to crop, according to character of soil and physical features of the tract to be irrigated, as well as according to volume of water available, to say nothing of the caprice of the individual irrigator, which often introduces variations of methods with a view to better adaptation to local conditions.

We are standing on a canal levee in the month of May, looking westward over alfalfa fields of almost limitless extent, overhead not a cloud to be seen. At our backs is the great Calloway Canal, now at its maximum flow, fed by the snows melting on the summit of the Sierra Nevada, even on the very slopes of Mt. Whitney. This is one of the north-side canals from Kern River, and the spot selected for our observation is some twenty miles to the northward of the parent stream, whose water is under as thorough control as that of any other large stream in the State. The Calloway Canal is the largest irrigation work receiving water from this river, if the combination drainage and irrigation canal of the Kern Valley Water Company* (Miller & Lux), be left out of comparison. But this is not the only other important Kern River canal, there being such notable works as the Beardsley, the McCord, and the Pioneer, on the north side of the river, and the Kern Island Canal, the Farmers', the Stine, the James, and many others, on the south side. The Calloway Canal, as it lies behind us, is a placid flowing stream about a hundred feet wide on the water surface, sixty feet wide on the bottom, and five feet in depth. This magnificent stream might elsewhere serve as a commercial highway; here it has other duties. At our left is a light wooden structure, an open-top culvert, sixteen feet wide, built through the canal levee. An attendant, a *zanjero*, is busily engaged in removing board after board from between upright posts, and presently he has a large volume of water, sixty to one hundred and fifty cubic feet per second, tumbling through the structure and rapidly filling the lateral, or branch ditch, which extends westward with the fall of the ground's surface, here less than ten feet per mile. Several hundred yards to our right a

* This canal receives the entire outflow of Buena Vista Lake, and in its channel, 125 feet wide on the bottom, seven to ten feet deep, carries it past the reclaimed swamp lands at the head of Buena Vista swamp, for a distance of over twenty miles.

second attendant has opened another similar gate, and as the branch ditches fill we see, at some distance along their courses, checkweirs, or drops, which hold the water in the upper section of each. Presently the water has risen high enough to flow through gates in the sides of these ditches, and begins to spread out over the alfalfa-covered space between them, and again we notice that its flow westward is checked, this time by a low, flat embankment which extends from ditch to ditch. The water thus confined to a compartment gradually inundates its entire area. The attendants in charge are meanwhile patroling the embankments which surround it, here and there re-enforcing weak spots, or checking the flow through some gopher or squirrel hole. An hour or two, depending upon the size of the compartment, or "check," elapses before we see the water creeping over the highest portions of the ground at the base of the main canal levee at our feet; and now one or two gates are opened, or breaches are made, in the embankment which separates the flooded compartment from the one next below, and the water of the first is rapidly drained off into the second. Gates from the branch ditches into the second compartment are opened, those leading to the first are closed, and thus the irrigation progresses until all the ground between the two branch ditches has been covered with water.

The water absorbed by the soil under this method of irrigation is usually two to six inches, provided dimension of checks and volume of supply are well proportioned, otherwise it may be much greater.

The area in each check, or compartment, in the great fields of the Kern County Land Company (J. B. Haggin) along Calloway Canal, ranges from about two to sixty acres. This method of irrigation is applied to any crop, but alfalfa and cereals are the principal culture of this district. The alfalfa field of Messrs. Miller & Lux, at the head of Buena Vista Swamp, also irrigated by a system of flooding similar to that just described, has an area of 20,000 acres.

To contrast with this, look at a hillside near Porterville, just north of Tule River. Here is a small irrigating ditch; it is but a step across, winding along the edge of a miscellaneous orchard, five or ten acres in area. The weather is warm and the owner in person is out, in his blouse, leaning on his shovel, and watching the slow progress of the water as it creeps along some thirty plow furrows which he has drawn, extra deep, through the well-tilled, black alluvial soil. He has turned the water from his irrigating ditch into a depression parallel with and just below the ditch, and from it the water spreads over the ground, accumulating in the upper ends of the plow furrows which lead down the hill slope at regular intervals, close enough together to wet the soil thoroughly. He has plenty of time for conversation, and explains how easily the water is controlled; it takes but a shovelful of earth here and there to keep the water from breaking out of bounds, or to check it in one furrow, or to accelerate in another.

In both of these cases the water flows to the land in open earthwork canals, or ditches, indicating an abundant supply and but little attempt at economic use. Elsewhere in the State, where the demand for water is relatively greater, and the products of the soil have greatest value, its distribution is occasionally effected in a system of pipes. There is then no loss in transit, or in barren subsoils. Water is turned loose upon the very spot to be wet, and irrigation is seen in its highest development. Duty of water, or the acreage per unit of volume, is there raised to its limit.

Water is in demand for irrigation in the spring and summer months. The rivers of the south, being fed principally by the winter rains, and there being but little snow in the tributary watershed of the mountains to maintain a summer flow, are at that time dry, or nearly dry. Those from the western slope of the Sierra Nevada which enter the great central valley from the east, are better sources of supply, because the natural storage of water in the form of snow is not exhausted until the beginning of July.

Without attempting any description in detail of irrigation systems, it will appear at once from this that water storage in reservoirs becomes a common feature among the irrigation systems of the south, but is rarely met with to the northward of Tehachapi. On the other hand, the great volumes of water available in the more northern rivers, which are often difficult to divert from their natural channels, have led to the use of canals of great capacity and to the construction of works of peculiar type for water diversion.

The Bear Valley system of San Bernardino County, with its reservoir formed by an arched masonry dam sixty-four feet high, 300 feet long on the crest, three feet thick at the top, and only eight and one half feet thick at forty-eight feet below the top, may

illustrate the one type of works; the Calloway Canal, extending thirty miles to the northward from Kern River, may illustrate another, and the great masonry dam, or overfall weir at La Grange, on Tuolumne River, which raises the water surface of that stream 100 feet and cost over $500,000, may serve to show how some difficulties in the way of water diversion may be overcome.

This last-mentioned structure has been undertaken by two irrigation districts organized under the law enacted in 1887, which authorizes the establishment of districts with municipal powers for the acquirement of water and the construction of works for its distribution. Under its operations more than thirty irrigation districts have been organized, more than $10,000,000 in bonds for the furthering of irrigation works were issued, and a new stimulus was given to irrigation development. Much is hoped from the operation of this law, but the progress thus far made under the system has not been entirely free from disappointment.

On all sides, however, the fact is being recognized that irrigation is of advantage and desirable, even where not necessary, and that the introduction of irrigation leads to a higher use of the soil. A mere glance at the vast dry-farmed grain fields of the Sacramento Valley, 150 miles long, thirty miles wide, threaded by the State's principal rivers, whose waters flow unused to the sea, may illustrate the possibilities of future development.

For examples of advanced irrigation development, look to the southern counties, among other localities: Redlands, Riverside, East Riverside, the vicinity of Los Angeles, National City, and the vicinity of San Diego; also to the surroundings of Fresno, Hanford, or Bakersfield.

Irrigation and irrigation works on large scale: Calloway Canal, and Kern Valley Water Company's works on Kern River, Kern County; Alta Irrigation District Canal on the south side of Kings River, Fresno and Tulare Counties; Crocker-Hoffman Canal on the south side of Merced River, Merced County; San Joaquin and Kings River Canal on the west side of San Joaquin River, Stanislaus and Merced Counties, and many others.

Notable diverting dams: Turlock and Modesto irrigation district dam at La Grange, Tuolumne River, Stanislaus County; Folsom Water Power Company's dam at Folsom, American River, Sacramento County.

Storage works of note: Sweetwater dam, San Diego County; Bear Valley dam, San Bernardino County.

Artesian wells: Those of Pomona are well known. A group of wells in the artesian basin of Santa Ana River supplies water to Gage Canal. In the San Joaquin Valley, near the northern line of Kern County, are many whose flow exceeds 1,000,000 gallons per day.

Windmills: Within a radius of two miles of Florin, Sacramento County, are 500 windmills, raising water from wells for irrigation, each with a duty of one to five acres.

Steam Pumps raising water from wells for irrigation can be seen near Woodland, Yolo County; at Florin, Sacramento County; at Lindsay, Tulare County; Colmena, Yuba County.

C. E. Grunsky.

Let me arise, and away
To the land that guards the dying day,
Whose burning tear, the evening star,
Drops silently to the wave afar:
The land where summers never cease
Their sunny psalm of light and peace,
Whose moonlight, poured for years untold,
Has drifted down in dust of gold;
Whose morning splendors, fallen in showers,
Leave ceaseless sunrise in the flowers.

—*Edward Rowland Sill.*

PHOTO BY TABER.

HYDRAULIC MINING, NORTH BLOOMFIELD MINE, NEVADA COUNTY.

CONDITION OF GOLD MINING IN CALIFORNIA.

By Charles G. Yale.

THE character of mining carried on in California in these days is entirely different from that done by the miners who came to the State in the "days of '49," when very simple appliances were all that they required to obtain the gold which the concentrating forces of Nature had gathered in the gulches, ravines, cañons, creeks, river bars, and river beds. The pick, pan, shovel, and rocker, long-tom, or sluice, were all the implements necessary, for this was the era of placer mining, when fortunes were gained in a day, and labor, not capital, was the prime requisite for successful mining.

At that time all the mining done was placer or surface work, and only the richer diggings were touched. Very little skill or experience was necessary, and the early-day miner collected the gold in quantities which now seem wonderful. In the one year of 1852 the sum of $81,294,000 was taken out. Gradually the area for this surface mining began to be narrowed down, and attention had to be turned to other sources of the gold for which all were in search. To-day, however, many of these old claims are still being worked over and over by Chinese miners, and as they are satisfied with small wages there are plenty of places for them to mine. White men own most of the ground, which they lease to Chinamen, and poor mining ground is now called "Chinese diggings."

After a time it was discovered that the great, red hills in the foothill and mountain counties in the central and northern part of California contained plenty of gold, though the material was much poorer than the concentrated shallow placers, necessitating the handling of more dirt. Then hydraulic mining was invented. Then, too, men began to inquire into the sources of the rich placers, and commenced to hunt for, open, and work the quartz ledges.

The collection of gold from these sources is a much more expensive operation than taking it from shallow surface placers, and very different systems have to be adopted. The method is practically the same as that pursued by nature — concentrating the heavier valuable material and washing away the lighter — but man's efforts are slow, and it takes time and money to handle the material.

With the necessary change in the character and system of mining came an entire change in the social conditions and methods of the miners themselves. People who only know about gold mining in California from the old stories of the mining camps in the "days of '49," would recognize none of the features should they visit the mining regions of the State in 1897. The nomadic habits of the miner have entirely disappeared, and with them the recklessness, drunkenness, and extravagance which were supposed to universally prevail. It is proper to note, however, that such habits were not universal by any means, though among the thousands who came were numbers of men who made necessary lynch law and vigilance committees. Around all the larger mines of the present day are permanent settlements, where the miners live with their families, content to work for wages and a sure income. The larger mining towns of the State, where there are a number of mines in operation, have lost entirely the old features of mining-camp life. The people have settled down to mining as a permanent business, and conduct it like any other industry.

The principal producing mines of the State now belong to private companies or individuals. Many small claims and prospects are owned by individual working miners, but capital is required to open and work quartz and gravel claims to conduct the business on an economical and profitable basis. Many of the wage-working miners, of course, do more or less prospecting for themselves, and many own small claims, which they work in a desultory manner until they can be disposed of to people in a position financially to bring them to a producing condition. California, as the pioneer of the gold-producing States of the Pacific Coast, and the one which has made the greatest aggregate yield, has very naturally long since passed its "boom" period, and its mining affairs are conducted on the same principles as any industrial business.

The auriferous gravels are worked by both the hydraulic and the drifting process. If the bed or channel of gravel is only covered by soil or earth which may be washed away by water thrown against the bank under pressure, then the whole mass, soil, gravel, and all is washed down to obtain the gold. If the channel of gravel is covered with hard lava which the water will not break up, then the deposit is "drifted"; that is, long tunnels are run under the lava capping, and the bottom stratum of rich gravel is removed and then washed on floors or crushed in "cement mills." The upper portion is in this case not disturbed, only the richer gravel being taken out.

These deposits of gold-bearing gravel were laid down by a system of prehistoric or "dead" rivers, whose channels were wider and slopes steeper than the present rivers. Through many centuries rain and frost disintegrated the rocks, and the rushing rivers carried the detritus down toward the valleys. The numerous quartz veins in the mountains were thus broken up, and the freed gold, being heavy, collected in the beds of these rivers, while the lighter detritus was transported further down. The beds of these old rivers constitute what are to-day called the auriferous gravel channels. They owe their richness to the enormous amount of erosion which had taken place, an amount considered by geologists to have been equal to a layer of rock several thousand feet in thickness. After these auriferous channels were thus filled and the gold collected in the gravels, volcanic eruptions occurred, and immense streams of molten lava hundreds of feet deep flowed directly down their beds. In this way the auriferous gravel channels were covered or buried by what is called the lava cap. When these masses of lava cooled and hardened, the rivers of the present day began to carve their courses downward from the mountains, and naturally sought the softer and lower portions, and owing to the hardness of the lava often formed channels by the side of the ancient beds. We see the result of their cutting in the cañons of the present streams, which are often one or two thousand feet deep. The old buried rivers under the lava are therefore high above the present ones. A great mountain ridge, or "divide," extends for many miles from the main range. Hundreds of feet below the top of this divide, and buried deep under lava is the graveled channel of a Pliocene river. On each side of this great ridge, and one or two thousand feet below the bed of the old buried river, flow the rivers of to-day. The new streams, in cutting their channels, often cross and recross the old ones, and thus washing out the gold the Californian pioneers found so abundant in the streams.

Miners run long tunnels into the sides of these "divides," or ridges, until they reach the old gravel channel carrying the gold. The lowest or richest portion of this gravel is then mined, and by drifting removed. If it is hard and "cemented," it is crushed in stamp mills and the gold saved; or if it is not cemented, the gravel is placed on washing floors, and a stream of water under pressure turned upon it, by which it is disintegrated and the gold freed and saved, the rock, sand, earth, etc., passing away down the flumes. This bottom cement gravel pays from three dollars to ten dollars per mine-carload, and when they breast out from fifty to 150 feet wide on the channel and six to eight feet high, the channel will yield from $100 to $200 per running foot, and often very much higher. These lava-capped divides covering the buried rivers are found in many counties in the upper part of California.

As stated, when these old river channels are under the lava they are "drifted." When there is no lava capping and only a bank or deposit from fifty to 150 feet high covered with trees, shrubs, etc., the hydraulic process is used, and the mass is washed away. The hard lava capping of the old rivers has resisted the elements better than the softer rocks, so that what were formerly the lowest points, or rivers, are now the higher mountain ridges. In some places the bones and teeth of elephants and other large animals are found, and pine cones and leaves are taken out as fresh looking as those of to-day, but they soon crumble on exposure to the air.

In hydraulicking a very much larger amount of dirt has to be handled than in drifting, but the process is cheaper. Ditches, reservoirs, and pipe lines are built, and water brought to the mine under heavy pressure. This is thrown against the bank through a nozzle, or "giant," as it is called, and tears down the gravel at a wonderful rate. Tunnels are run, in which blasts of powder are placed, and the bank is thus shaken up. Sometimes 20,000 or 30,000 pounds of powder are exploded at one time, disintegrating many thousand cubic yards of earth which the water then attacks. The material thus washed down passes through flumes or sluices, where the gold is caught in riffles with quicksilver,

the rock and earth passing on to a dumping place. In this way all labor of shoveling or handling is avoided, and immense amounts of material may be moved in a short space of time. It can be imagined how much material is moved by hydraulic mining when it is stated that the bulk of this auriferous earth is only worth three or four cents a cubic yard; yet these mines in the height of their prosperity yielded eight or ten million dollars a year. Mines of this character are quite expensive to open and equip, since so large a water supply has to be provided, and ditches, reservoirs, flumes, etc., have to be built and maintained. Therefore the larger and more productive ones are only worked by large companies.

There was a serious controversy in California about this class of mining, which lasted some years. In washing away the high banks or hills, the debris, or tailings, as the waste material is called, filled in and injured the navigable streams and the farming lands along their banks. Long and costly and bitter controversy between the farmers of the valley and the miners of the mountains finally resulted in closing the hydraulic mines down by injunctions of the United States courts, and these mines, large and small, were compelled to stop work wherever their debris went into the main streams or their tributaries. Thus great productive hydraulic mining properties, with their extensive ditch systems, reservoirs, and mining plants, in which about one hundred millions of dollars were invested, became unproductive and valueless. This condition of affairs continued for some years, and the annual gold product of the State fell off materially.

The towns and camps in the hydraulic mining regions of the State became depopulated, and large numbers of people were thrown out of employment. This condition of affairs continued for ten or twelve years, until the matter was agitated before Congress, which resulted in a law being passed which permits these auriferous gravel mines to be operated by the hydraulic process under certain conditions and restrictions. The essential features of the law are, that all such mines operated under the hydraulic system shall impound, or restrain, their debris, or tailings, and prevent them entering the navigable streams, or injuring the land of other parties. The California Debris Commission, consisting of three United States engineer officers, is empowered to issue licenses for mining by the hydraulic process under this law, when it is satisfied that the debris dams or impounding works are sufficient to restrain the debris resulting from the mining operations of the claim. The hydraulic miner must make application to the Commission for permission to mine, and submit plans for the proposed restraining works, which are subject to the approval of the Commission. Each separate application is advertised for a specified time, and a hearing is held before the Commission, at which those opposed to the issuance of the license may state their reasons. After a thorough investigation, if satisfied that the debris can be restrained, a license to operate by the hydraulic process is granted, and the mine may begin operations. If the engineers see any reason to believe, however, that damage will be done to rivers or to individuals by the operation of the mine, no license is granted, and the mine may not be legally worked. Moreover, even after a license is granted, if debris is, for any reason, permitted to enter a stream, or if it is not properly impounded, the license may be recalled. This Government Commission has jurisdiction over all hydraulic mines in the drainage basin of the Sacramento and San Joaquin Rivers and their tributataries. In the northwestern part of California, in Siskiyou and Trinity counties, where there are extensive gravel deposits and many hydraulic mines, there is no restriction on hydraulic mining. The hydraulic mines in that section dump their tailings, or debris, into the tributaries of the Klamath River, which has been officially declared a non-navigable stream.

In those parts of the State where licenses must be obtained, the miners themselves must bear the expense of the impounding works for their respective mines, and for this reason many hundreds of the smaller ones, especially in Sierra and Plumas counties, where they are numerous, are still closed down. Their owners, having become impoverished by enforced cessation of operations during a series of years, have not generally the money to construct the necessary impounding works. Still, since the law was passed, some hundreds of the hydraulic mines have been granted licenses to mine, and are now being operated, but not on the former scale, as by having to impound and settle their debris, they are restricted in the amount of gravel they may wash in a given time.

There are still very large areas of this auriferous gravel which have not been touched by the miners. These undeveloped gravel channels need the aid of capital to be brought to a productive stage.

The drift gravel miners are not restricted in their operations. These are also mines of auriferous gravel, but the ground being covered by a lava capping, it is impossible to wash the gravel by the hydraulic system.

In the hydraulic and drift, as well as in the quartz mines, experience shows that those enterprises into which capital has been put pay the best profit, and that gold mining on a small scale is not proportionately so remunerative as that carried on in a systematic manner, backed by abundant means. The long tunnels, through barren material, to reach the channel in the drift mines; the money required for the reservoir, ditch, and pipe systems of the hydraulic mines, and the expensive machinery for the quartz mines, account for this feature of gold mining. It doubtless may seem strange to many that investment of capital is necessary in this particular kind of industry, and that a man having a gold mine should be in need of financial help. Still, as in almost every other kind of business, much more can be done with capital than without it. If the prospector in the mining regions finds a ledge of gold-bearing rock which is rich near the surface, he may take out considerable gold at once, but generally they have to sink deep shafts to properly open the mine. He may sink a short shaft and find good indications of permanency in his ledge, but to sink deeper he must have a pump to take out the water and a machine hoist to take out waste and ore. He needs timbers, supplies, and labor. Then he must have some sort of mill to crush his ore, and if there are sulphurets he needs concentrators to save them. All these things cost money, and money few prospectors have. Even if he succeeds in getting down a couple of hundred feet, his requirements become greater, for heavier machinery is needed, and also some kind of power, steam, electricity, or water. This involves engines, boilers, etc. The result of this is, that there are in all the mining counties of California hundreds of half-opened mines where men have had to quit work, simply because they did not have the money to go on further with development or to furnish machinery to work the claims. Naturally, most of such claims are for sale. Again, some small company may start to work such a claim and try to bring it to a producing stage and then have to quit because they have not funds enough. Nearly everywhere there is apt to be barren ground through which it is expensive to sink, and floods of water sometimes drown out a mine not properly equipped with pumping machinery.

The rich companies often have to spend one, two, or three hundred thousand dollars, and do not expect any returns until this money is spent in development and equipment of the mine. Some mines are unprofitable when worked in a small way, which pay handsomely when properly developed and equipped.

Most of the gold now being produced in California comes from the quartz mines which are found in the mountainous portions of nearly the whole State. They occur in association with all the different kinds of metamorphic and eruptive rocks, but are particularly abundant in what is termed the auriferous slate. Some of the quartz mines of the State which have been worked for twenty or thirty years are still producing, and several are now worked to a depth of over 2000 feet.

A quartz ledge or vein is a fissure in the earth which is filled with quartz containing more or less gold; that is, the one you own generally has less and that of some other fellow near by has more. The country rock enclosing the ledge on both sides is barren, and the ledge matter is what the miners have to get out as best they may. Shafts are sunk, and drifts and crosscuts run to extract this ore, and all the openings thus made have to be timbered up strongly to prevent caves. Often a great amount of valueless material or waste has to be moved to properly work the mine, so that it is not only the gold-bearing rock which is hoisted to the surface. Where the lay of the mountain permits, the mines are opened by tunnels instead of shafts, but in some cases both tunnels and shafts are made on the same mine. Where a tunnel is possible, the water drains off itself, but in shafts the water must be pumped or hoisted out in baling tanks. At the bottom of the shaft is a sump, or continuation of the shaft, where the water collects, and from which it is pumped. In breaking down the rock in running the drifts, etc., holes have to be drilled and powder used for blasting. These ledges are of an average width of two to three feet, and extend downward to an indefinite depth. Sometimes they are thirty, forty, or fifty feet wide and sometimes only a few inches. Generally speaking, the wide ones are poorer in gold, on the average, than the small ones; still the very wide ones of low grade are preferred to the small but richer ones by companies which invest in these properties.

The large veins of medium or low grade ore are supposed to be more lasting than the

small ones, and pay very handsomely when extensive crushing mills are provided. In all these mines some portions are poor and others rich, but there is no way of telling anything about this in advance, unless one happens to be like the man who was sure that there was money in a certain mine because he had put in $50,000 and never got it out. When men tell about quartz from these mines running from $500 to $1000 per ton, it can be put down as "bosh," or in that case there is very little of the rock. "Pockets," or small bunches of ore, as rich as that are sometimes found in a ledge, but they are very scarce and are often succeeded by barren rock, which may continue a long time before another pocket is found.

When the ore is raised to the surface from the mine, it is dumped in bins or hoppers above the mill, from which it falls by gravity into large, steam-driven rock-breakers, which crush it into small pieces, and thence it slides, again by gravity, into what are called ore-feeders. One of these is placed in behind each battery of five stamps of the mill, and is so arranged that at each drop of a stamp a small quantity of ore is fed under the stamps. The amount to be fed may be regulated according to the character of the ore.

The stamps, which weigh from 900 to 1000 pounds each and drop 90 to 100 times each per minute, are arranged in groups of five, each five having a mortar of their own. In this are five steel dies on which the shoes of the stamps drop, the ore being crushed between the shoe and die. In the mortar in which the stamps drop on the ore, quicksilver is placed so as to catch the gold as it is freed from the rock. Water passes through the mortar continually and washes the ore, as it is crushed, through fine screens on to inclined aprons or small sluices placed in front of each battery. These aprons are covered with sheets of silver-plated copper on which amalgam or quicksilver is placed, so as to catch any gold which escapes from the mortars with the finely crushed ore. These aprons are scraped periodically to remove the amalgam and gold. The amalgam — which is gold and quicksilver mixed — from the mortars and from these plates is placed in a buckskin bag, and the free quicksilver squeezed out, the hard amalgam remaining being then retorted. The heat in the retort evaporates the quicksilver, which is saved by being again condensed, and the gold is left in the retort. This is then melted into bars, sent to the Mint and turned into coin, and we all fight in our various ways to get hold of as much of it as we can.

In addition to the "free" gold,—that is, in a pure native state—most of the ore in these ledges carries sulphurets or pyrites of iron, also containing gold, but in such a condition that it will not amalgamate with the quicksilver. The crushed ore, therefore, after going through the batteries and over the aprons as described, passes on to concentrators on the floor below. These consist of inclined endless rubber belts, which are revolved and have also a shaking motion. They are so arranged and operated that the light tailings or worthless material pass away, while they collect and concentrate the heavy sulphurets and any stray gold or amalgam which may have passed through the mortars. A concentrator is used for each five-stamp battery. The sulphurets thus collected are roasted in a furnace to drive off the sulphur, and are then so treated by the chlorination process that the gold is first dissolved and then precipitated from the solution. Only a few mills have a chlorination plant of their own, most of the miners selling their sulphurets to the smelting works. A ton of rock may contain only from one to three per cent. of sulphurets, and these are often worth from a hundred to a thousand dollars a ton, but it takes time and rock to get a ton of them. The usual average is from one to one and a half per cent. of sulphurets, worth from $75 to $150 per ton.

In some mines there is little or no free gold, but the rock has to be crushed and concentrated to obtain the sulphurets which carry the gold values. After passing all these appliances the pulp, as the crushed ore is called, still has some value, and is led through sluices to a canvas plant. Broad sheets of ordinary canvas are spread smoothly on slightly inclined surfaces, and over these the tailings pass, carried by the water, and clear water is added. The little fibers of the canvas catch very fine gold and rich "slimes" which may have escaped the other appliances. At some mines the cyanide process is made use of to save gold from ores which it is difficult to treat by the ordinary milling process, and cyaniding is also done with tailings which still contain some gold. By this process the finely crushed ore is placed in vats and treated with a weak solution of cyanide of potassium, by which the gold is dissolved, and from this solution the gold is afterward precipitated by passing it through zinc sponge, and is thus recovered.

In some small mines where they cannot afford a stamp or roller mill, the old-fashioned

Mexican arastra is used for crushing and amalgamating the ore. This is a circular bed of stone or rocks inclosed by a rim, and having a vertical central shaft on which are horizontal arms. To these arms are fastened by chains great stones with a flat under surface, which are dragged by the arms over the stone-paved surface of the central circular bed. Horses or mules are used to give the circular motion necessary to drag the stones around the circle. Water and quicksilver are mixed with the pulp or ore. The stones move slowly around the circle, grinding the ore and polishing the tiny specks of gold which the quicksilver then catches. Every now and then they "clean up" by adding water and thinning down the pulp until it is washed away, leaving the quicksilver and gold in the crevices of the bed of the arastra. A great many miners use these machines for working their own ore when it is rich enough to pay by this process, which is quite slow. The miners can build this sort of a mill themselves. Sometimes they are run by steam or water power and used for working the tailings from a mill. There are several other forms of mills for crushing ore from mines, and some with rollers are used where the rock is not very hard.

There are various forms of placer, or surface, gold mining carried on in different parts of California. The beach mining is rather a peculiar feature. In many places along the coast the magnetic iron sands, or "black sands," as they are called, carry an appreciable quantity of gold, and many of the ocean beaches have black sand mines in operation. The upper, or lighter, stratum of white beach sand is removed, and the lower, heavier stratum of black sand is washed in sluices. It is difficult to save the gold, because there is so little difference in the specific gravity of the particles of black iron sand and the fine, light, flaky gold. Quicksilver is used in the sluices. The black sands are also washed in a machine, called a "tom," the sand being elevated by a Chinese pump and passed through this appliance. The large toms handle about 200 tons of sand in twenty-four hours.

These sands often carry a small percentage of platinum, which is also saved. The beaches are richer at some periods than at others. When the winds throw the ocean waves at a cutting angle along the beach, the sands are concentrated by the wave-action, the lighter being carried away, and the auriferous black sand being in a more concentrated condition. These sands usually do not contain more than from seventy-five cents to a dollar and a half per ton, but sometimes rich patches are found.

River-bed mining is carried on at many of the mountain streams. In some places extensive flumes are built to carry the water of the whole river during certain months when the river is low, and the river bed is thus laid bare, so the gravel may be handled and the gold obtained. Along the Klâmath and some other rivers the miners build wing-dams, so as to divert a portion of the water and leave a small section bare. Then they put in current wheels, which operate pumps to take the water out of the ground they are working, and thus obtain the auriferous gravel, etc., and wash it in sluices, getting the gold. At high stages of the water this kind of mining cannot be carried on.

From all classes of gold mines the average annual product of the State for the past forty-eight years has been about twenty-six and a half million dollars, the total output of gold since 1849 having aggregated $1,282,398,779. The annual yield is now between sixteen and seventeen million dollars, and has shown an increase in each of the last three years. In view of the many developments and investment of capital, the annual yield is expected to reach twenty millions of dollars before long.

The conditions under which mining is carried on have changed materially for the better. The mining country has been more densely settled, means of transportation have vastly improved, machinery has been perfected and cheapened, all supplies have become cheaper, and radical changes have taken place in the systems of mining and of handling and treating ores. High-priced officials and supernumeraries have been done away with; there is a closer system in conducting operations; and all the appliances necessary are not only more perfect but cheaper. As a result of all these factors, ore is now mined and milled at a much less cost than formerly, and mines that twenty years ago would run a company in debt can now be made to pay a handsome profit. Each year has shown a gradual reduction in cost, and improvement in the method of treating ores, and with every dollar off this cost, hundreds of mines have been added to the list of producers. The successful treatment at low cost of the rich auriferous sulphurets found in the ores of nearly all our quartz mines, has been an important factor, as at one time little attention

was paid to them, whereas now all mills are equipped with appliances for saving them for ultimate treatment, in addition to the ordinary methods for saving the free gold.

There is plenty of opportunity for investment in the gold mines of the State, but this should not be undertaken by those unfamiliar with the business, except upon the advice of persons of experience. Even those long in the business, and who have invested large sums, do not purchase properties or interests in them on their own judgment alone, but employ skilled experts to make examinations and reports. There are so many conditions to be taken into consideration that it is foolish to invest money in this kind of property without very careful examination in advance.

While the principal product of the mineral world in California is gold, there are many other substances mined, which swell the total valuation of the mineral output of the State to upwards of twenty-four million dollars a year. Several of these products are not mined in other States. Quicksilver, for instance, is nowhere else mined on this continent, and since we first began working it California has produced upwards of seventy-seven million dollars' worth, and continues to produce it at the rate of over a million dollars a year.

For the last seventeen years the total silver product has been over twenty millllion dollars.

All the borax in this country comes from California and Nevada, and eleven twelfths of that is from California. The annual output of this substance is from six to seven hundred thousand dollars.

This State produces more rock asphalt than any other, and is the only one yielding natural liquid asphalt.

Magnesite, used in paper manufacture and for furnace linings, is mined here only.

The only product of chrome in the United States is from California, and all the antimony is from this State and Nevada.

The only platinum found in the United States is taken with the gold from the beach black sands and from the black sands of the auriferous gravel mines.

The mineral oils are very valuable, and we stand sixth among the other States in value of petroleum product. The oil fields are only partly developed, there being still large areas of oil-bearing ground yet unopened.

The value of the structural materials, including cement, clays, limestone, granite, sandstone, macadam, paving blocks, slate, marble, onyx, etc., is over two million dollars a year.

The following official statement of the State Mineralogist shows the amount and value of different substances mined in California last year:—

MINERAL OUTPUT OF CALIFORNIA IN 1896.

	Amount.	Value.		Amount.	Value.
Antimony	17 tons	$ 2,320 00	Manganese	318 tons	$ 3,415 00
Asphaltum	20,914 tons	362,590 00	Marble	7,889 cu. ft.	32,415 00
Bituminous Rock	49,456 tons	122,500 00	Mineral Paint	395 tons	5,540 00
Borax	6,754 tons	675,400 00	Mineral Water	808,834 gals	337,434 00
Cement	9,500 bbls	28,250 00	Natural Gas		111,457 00
Chrome	786 tons	7.775 00	Onyx	3,000 cu. ft.	24,000 00
Clays—Brick	24,000 M	524,740 00	Paving Blocks	4,161 M	77,584 00
Pottery, etc.	41,907 tons	62,900 00	Petroleum	1,257,780 bbls	1,180,793 00
Coal	70,649 tons	161,335 00	Platinum	162 ozs.	944 00
Copper	1,992,844 lbs	199,518 70	Quicksilver	30,765 flasks	1,075,449 00
Gold		17,181,562 70	Rubble	313,973 tons	329,639 00
Granite	182,261 cu. ft.	201,004 00	Salt	64,743 tons	153,244 00
Gypsum	1,310 tons	12,580 00	Sandstone	58,542 cu. ft.	28,378 00
Lead	1,293,500 lbs.	38,805 00	Serpentine	1,500 cu. ft.	6,000 00
Lime	302,750 bbls	261,505 00	Silver		422,463 60
Limestone	68,184 tons	71,112 00	Slate	500 sqrs	2,500 00
Macadam	646,646 tons	510,245 00	Soda	3,000 tons	65,000 00
Magnesite	1,500 tons	11,000 00	Total value		$24,291,398 00

The total value of the mineral product of the State in 1895 was $22,844,664.29.

In nearly all these branches of mineral industry there is room for increase of product, as more capital is invested in the various mines. There are numerous known deposits which are not worked or utilized, owing to lack of transportation facilities, or because of cost of shipping to markets at a distance.

Generally speaking, the gold mines are in the Sierra Nevada range of mountains, and in the foothills of the desert regions. In the Coast Range are found the mines of quicksilver, chrome, manganese, coal, bituminous rock, etc. The main oil fields are in the southern part of the State. The auriferous gravel mines are in the upper part of the State, but the gold quartz mines are found in the extreme north, extreme south, and all along the intervening distance.

The following table from the official statement of the State Mineralogist for 1896 shows the relative importance of the different counties of California in point of mineral production, the amounts in dollars including the values of all substances mined in the respective counties named for the year:—

County.	Value Mineral Product, 1896.	County.	Value Mineral Product, 1896.	County.	Value Mineral Product, 1896.
Alameda	$ 230,630 00	Mariposa	$ 335,817 44	Santa Clara	$ 318,415 00
Alpine	400 00	Merced	1,250 00	Santa Cruz	239,199 00
Amador	1,593,021 02	Mono	562,042 31	Shasta	813,593 29
Butte	755,480 88	Monterey	1,000 00	Sierra	786,598 27
Calaveras	1,555,888 85	Napa	495,366 00	Siskiyou	1,091,917 47
Colusa	14,584 00	Nevada	2,392,160 42	Solano	23,413 00
Contra Costa	138,109 00	Placer	1,735,750 55	Sonoma	135,146 00
Del Norte	24,150 00	Plumas	462,609 61	Stanislaus	18,435 00
El Dorado	819,481 22	Riverside	355,598 00	Tehama	475 00
Fresno	85,884 60	Sacramento	189,268 00	Trinity	1,435,365 30
Humboldt	308,546 85	San Benito	91,095 00	Tuolumne	1,070,470 13
Inyo	497,626 48	San Bernardino	1,003,889 80	Tulare	25,752 00
Kern	710,010 35	San Diego	603,991 00	Ventura	292,800 00
Lake	264,944 00	San Francisco	322,667 00	Yolo	378 00
Lassen	40,300 00	San Joaquin	120,157 00	Yuba	171,687 77
Los Angeles	1,072,738 55	San Luis Obispo	37,271 00	Unapportioned	380,200 00
Madera	186,904 84	San Mateo	2,500 00		
Marin	93,260 00	Santa Barbara	383,159 00		$24,291,398 00

Chas G. Yale

MINING.

By Charles E. Uren.

PROBABLY no industry is less known to the general public than mining, and inquiries concerning its particular location within the State and its *status*, as a general rule, meet with misleading and erroneous answers from those unfamiliar with it.

The great mineral wealth of California is known incidentally throughout the world, but details such as would be of an advantage to those visiting the State, either for the purpose of settlement or for pleasure, are meager at the best.

Mining is the leading industry in most of our northern counties, and later developments include many of the southern counties among the mineral-producing sections of the State. The leading mining counties, according to their record as bullion-producers, are, Nevada, Amador, El Dorado, Placer, Calaveras, Tuolumne, Butte, Shasta, Trinity, Siskiyou, Mariposa, Lake, Kern, and Fresno.

The inception of *gold*-mining in California was at Coloma, in 1848. Subsequently the shallow, or ravine and river, placers were worked throughout the entire gold-producing counties, and exhausted. Mining of this character finally resulted in the discovery of larger gravel deposits, situated in close proximity to the ravines, known as bench or bar claims. The extreme depth of gravel deposits of this character rendered it desirable to devise means for cheaply handling the increased quantity of auriferous gravel, wherein the gold had been more evenly distributed—methods which eventually developed the hydraulic system of mining.

This character of mining was prosecuted vigorously for a number of years, and was very profitable, but owing to the litigation that followed, known as the "Debris Suits," which brought the farmer who owned land below the outlet of the mines in conflict with the miner, the hydraulic miner was restrained from dumping his tailings into the rivers, and laws were enacted providing for properly impounding the debris—an expense entailed upon the miner, and which made hydraulic mining thus encumbered unprofitable, except in localities favorable for safely impounding the tailings.

The partial cessation of hydraulic mining led to more active development in drift mining. This class of mining is confined to the gravel deposits of the old river channels, which traverse a greater part of Northern and Eastern California. Recent developments have shown that these deposits are very extensive, and practically inexhaustible. Among the number of successful mines of this character might be mentioned, the Morning Star, Mayflower, Bruce and Wheeler, and Waterhouse and Lester Mines of Placer County, The Magalia of Butte County, and the Harmony Mines of Nevada County, which have all been great bullion-producers. The auriferous gravel channels extend from Humboldt County to Fresno, and are being systematically developed throughout.

The discovery of gold in quartz was made at the Gold Hill Mine, Grass Valley, Nevada County, in October, 1848. This was the beginning of a new era in mining, and led to the manufacturing of milling and mining machinery. The honor of the first gold mill constructed is divided between the Gold Hill Mine, Grass Valley, Nevada County, and the Old Benton Mill, on the Merced River, in Mariposa County, constructed by General John C. Fremont.

Quartz mining is to-day the leading mining industry of California, and its development has been successfully carried on in all of the counties. Grass Valley Mining District has more than ten miles of hoisting shafts, and about fifty-one miles of levels and drifts, while Nevada City, four miles distant, has more than two miles of hoisting shafts and twenty miles of levels or drifts.

Along the Mother Lode, in Amador, Calaveras, Tuolumne, and Mariposa Counties, are numerous shafts, varying in depth from 2100 to 1000 feet, with several miles of lateral drifts. These figures tend to show the vast amount of capital expended in mining and the tendency to permanency of our quartz mines.

Does mining, from the practical demonstration thus far made, prove a paying, and therefore a business, proposition? From the general information to be had, and the record of bullion produced from the several counties named, it is safe to say that mining in California, when properly and economically managed, pays better, as a rule, than any other business.

During the period of placer mining, especially when applied to creek or river mining, all of the available gravel was *worked out.* Hydraulic mining is now limited to places favorable to the construction of impounding dams, to comply with the present restrictions on that class of mining. Drift mining is yet in its infancy.

The restriction of hydraulic mining stimulated quartz mining, which is now the most prominent industry. The limit of pay in this class of mines has not yet been demonstrated as far as depth and lateral extent is concerned.

The best evidence of permanency is the great depth attained by the following mines, with rich ore still continuing in depth: Idaho Mine, 2183 feet vertical and over 3000 feet on the dip of the vein; Empire Mine, 2100 feet; North Star, 2800; Champion and Providence Mines, 2100 feet each, all in Nevada County; Kennedy, Jackson, Amador County, 2100 feet; and several other mines of lesser depth.

The geological formations in which the best mines are found, are numerous. Those of Nevada County are in diabase, divrite, slate, serpentine, and granite; those of El Dorado, Amador, Calaveras, Tuolumne, and Mariposa Counties, along the Mother Lode, are in slate and diabase, and in other portions of the State in porphyry and limestone. Usually a contact vein, one lying between two distinct formations, is the most permanent and well-defined.

Usually the veins are free milling ores. An exception is noted, however, in some of the veins found in Shasta and the northern counties. These contain little silver, and are permeated with auriferous sulphurets of galena, iron, and copper pyrites.

The Idaho Mine has produced $12,000,000; the Empire Mine $6,000,000, the North Star Mine $8,000,000, all of Nevada County; the Eureka Mine $10,000,000, the Keystone

$13,000,000, the Kennedy $10,000,000, all in Amador County. Others have produced in proportion to depth and the number of years worked.

The Idaho Mine paid at one time $350,000 annually, and the Utica Mine, Calaveras County, $3,000,000 annually. The average production from these mines at the present time will probably be about fifty per cent. less.

What is the average pay usually for miners and other skilled labor at the mines; also for ordinary or unskilled labor?

The pay of miners varies according to locality. In Nevada County the wages are three dollars a day for miners and skilled laborers; unskilled laborers are paid from two dollars to two dollars and fifty cents. This scale applies also to Sierra, Plumas, Shasta, and Trinity Counties. Along the Mother Lode in El Dorado, Amador, Calaveras, and Tuolumne skilled labor is paid two dollars and fifty cents a day, and unskilled labor two dollars a day.

Chas. E. Mrew

AGRICULTURAL POLICIES AND PRACTICES IN CALIFORNIA.

By Alfred Holman, Editor of the Pacific Rural Press.

THE Eastern visitor who makes inquiry or observation concerning Californian farming is first of all impressed with the differences, both in policies and methods, between what he see and hears and that to which he has been accustomed in his Eastern home. At first he is often tempted to denounce Californian methods as slipshod and shiftless, and to proclaim the great advantage it would be if the more thrifty and Eastern style of farming were followed in California. If he comes to California to live, or if he looks more carefully into local facts and conditions, he becomes convinced that his first impressions were in some respects erroneous, and that though California has indeed much to learn from older countries in agricultural thrift and system, neither Eastern nor European policies nor methods will exactly apply to Californian conditions, consequently cannot be blindly followed. To urge the agricultural spirit of the more progressive Eastern farmers as fit for emulation in California is often wise; to urge the adoption of the methods by which these men succeed at the East is as often unwise. Of course the same agricultural and economic principles apply everywhere in the world, but the manner of their local application widely differs. The mental attitude of the Eastern critic should therefore be one of careful inquiry, and upon the results of such inquiry should be based his suggestion. Too many visitors proceed to suggestion without inquiry or understanding, and their loud declamations are as sounding brass to the thinking Californian.

The first fact which the Eastern agricultural visitor should recognize is, that California is essentially different in nature, tradition, and inheritance from the other States of the Union, and that all these differences affect agricultural policies. Differences based upon natural conditions and resources will endure and give rise to distinctive Californian farming methods; differences resulting from tradition and inheritance will yield to progressive modifications, and will ultimately disappear and give place, no doubt, to policies involving greater prosperity and development to the State. Consequently the Eastern critic should be discriminating, and see to it that he does not shatter his lance in a tilt against invulnerable natural conditions, but maintains its point for the exposure of unthrift, fallacy, and hydrocephalism—all of which (though less abundant than formerly) still impede our agricultural progress.

Probably the most striking differences between Californian and Eastern farm policies, and which receive the condemnation of visitors, are to be found in the following directions:—

(1) Ownership of land in large tracts.

(2) Farming of large areas for a single product or a few products of the same class, or subdivision of the land into small holdings, to be directed into a single line of produce. This is what is called specialty farming.

(3) Neglect of production of household supplies upon the farm, and consequent purchase of the same, frequently at prices based upon a long credit system.

(4) The absence of home-like character and air to many Californian rural habitations, and the inferiority of barns and outbuildings.

(5) The use of machinery and implements of great capacity and economy, in view of amount accomplished, but often operated with greater regard to quantity than quality in work or product.

(6) The employment of policies and methods which seem dictated by speculative disposition, rather than by the cautious conservatism and calculation which pervades Eastern farming.

(7) The thirst of the Californian for a great enterprise in whatever line he pursues.

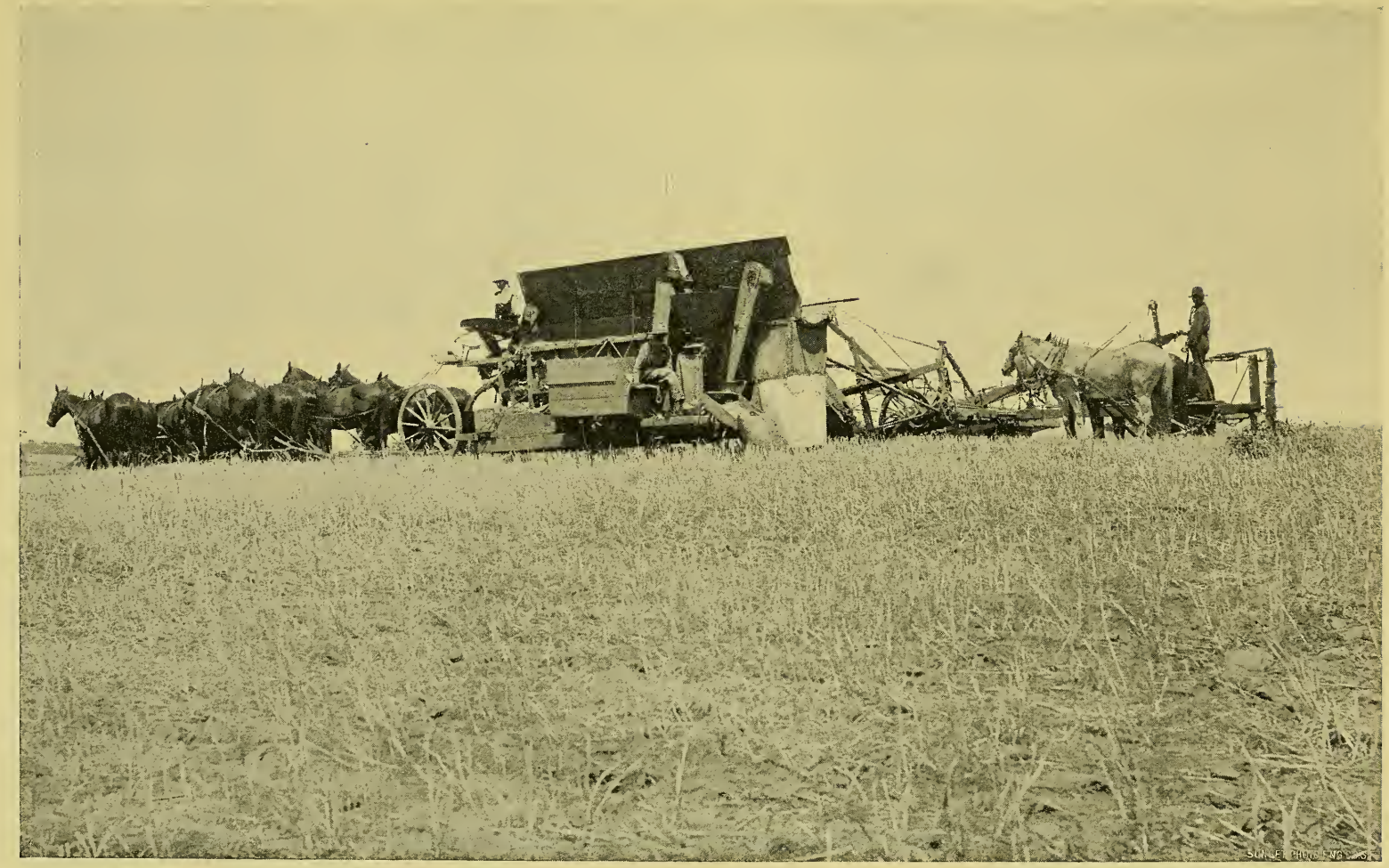
(8) The adoption of methods of cultivation which seem to the Eastern observer shiftless and wasteful, and the neglect of provisions which he regards chief factors in thrift and success.

An attempt will be made to comment briefly upon these indictments of Californian agriculture, in a spirit of candor, and to indicate to what extent they are well placed or due to misapprehension.

The ownership of Californian lands in large tracts is in fact an inheritance from a previous régime, and in part attributable to the early American conception of the adaptability of the lands themselves. During the Spanish supremacy, land was measured by leagues, not by acres; and aside from the Mission establishments, the territory was on a grazing, not an agricultural basis. During the first decade of American occupation, there was at least serious doubt as to whether the land had agricultural value, except as far as irrigation water could be distributed over it. When agriculture began with the growth of grain during the rainy season, land values were so low that immense areas could be easily acquired, and the grain product was so large and high in value that in a year of generous rainfall a single crop might not only pay for the land, but enrich the owner besides. The same was true when the demands of the great mining population called for large quantities of beef and mutton, and when the wool values following the war spread innumerable sheep over the valleys and foothills. Land was limitless; enterprising herd and flock owners were few. There was no reason whatever to entertain the old-fashioned policy of maximum production upon minimum area, and if anyone thought of it, he hastily concluded that the land and climate were not adapted to it. It was easier to get a township of land than to subdue an acre to a rational system of tillage, and so any man of capacity and enterprise became a land baron. Of course the conception of California's adaptabilities involved in the early policies of production was largely wrong, and is no longer defended. There has been for the last quarter of a century disintegration of the large holdings. Populous cities and towns, with their environment of small farms, now occupy some of the dukedoms which were acquired for a song, or a threat, or a promise; and it is possible now to buy good improved land in any quantity that one may desire at prices to suit any purse, or in a location to gratify any fancy—under the same rules that apply everywhere else in the world, viz. that proximity to thriving settlements constitutes an added value.

But while there remains of the old large-ranch idea hardly anything worth mentioning as an obstacle to acquisition by the new settler, it must be stated that until natural conditions are modified by the increase of the irrigated area, there are vast tracts of fertile valley land which can only be profitably handled as large farms. The prices of staple winter-growing products, for which these lands in their natural state are alone adapted, are so low that the most economical methods of production must be employed, and the profit of many acres must be combined to equal the expenditure even of a frugal household. Aside from the valley plains, there are uplands of such peculiar character that only pasturage can be had from them, and in some cases no organisms, save those endowed with the foot of the goat or the wing of the bee, can gather the richness of the land.

Let the critic of the large farms of California conclude, then, that California really does not now cherish the land baron policy, except as it survives from a phase of development which is rapidly passing, or where natural conditions demand that large farming shall



COMBINED HARVESTER IN OPERATION, SAN JOAQUIN VALLEY.

prevail until the conditions themselves are changed by enterprise and investment, which do not at present seem warranted. And it works no hardship whatever to the new comers that this is so. They can have a thousand small farms if they wish them, and each time they take a thousand they set in motion the agencies which will develop a thousand more.

The specialty farming of California is, to a certain extent, open to impeachment by advocates of mixed farming, as is specialty farming elsewhere, and it has the same points in its support, and many more. The natural conditions of soil and climate in California are not only widely diverse, but they differ sharply within short distances. It is the part of wisdom to use each region, each locality, in fact each piece of land, for whatever of marketable produce it yields in the most profitable quantity and quality. Those who have attained success are those who have displayed the greatest acuteness in detecting local adaptations and promptness in employing them. Most of the failures result from pursuing some preconception of what a grower ought to do, without proper appreciation of the fact that local adaptations are the ruling factor. Wholly apart, then, from the disposition of the Californian to court reputation for greatness—which will be noted later—it is clearly true that our fruit regions, our dairy regions, our grain regions, etc., are set apart as such by natural conditions specially favoring this or that line of production; and to preach diversification with a view to breaking down these natural distinctions and differentiations, is folly. To advise mixed farming in California simply because it is mixed, is a fallacy. It is just as bad as advocating specialty farming as such. The honors are easy between the theoretical arguments on both sides, and neither strikes the foundation of things. But it is also true, that as we have regions for specialty, so we have regions for diversity, and the advocates of each policy can develop splendid demonstrations of their views if they are fortunate enough to select proper locations and conditions. Probably California can exhibit more successes and failures of all conceptions of farm policy than any other equal area of the earth's surface.

But while specialty farming is strictly a rational proceeding in California, as above claimed, it is also true that there should be greater attention to diversification, wherever and to the extent that natural or arranged conditions will admit. During the last few years the small farmers who have produced their own home supplies and have had many products, even in small amounts, to sell or exchange, have had more comforts and escaped more hardships than those who have not had the disposition or the favoring natural conditions for diversified effort. There is, of course, a certain breadth of adaptation, even in regions of special physical features, and a man should put forth the utmost effort to employ the breadth as well as the depth of his endowment. The owner of irrigated or moist land in the interior, who has had alfalfa as well as fruit, has been the better for it; and the owner in coast valleys who has had sugar beets as well as beans or hay or milk products, has been profited. Everywhere, too where the farmer in any region has broadened his local conditions—as for instance, by the introduction of irrigation, even by well and windmill—has thus enabled himself to have an area of green growth in the dry season upon his grain or stock farm, and has commanded the opportunity for such diversification at least as favored his home supply of garden, dairy, and poultry products, and has been benefited thereby. So far then as the critic urges diversification within the limits of natural or acquired conditions, he is wise; but let him avoid sweeping preachments on the subject.

With reference to the character of Californian farm buildings and the dreary environment of too many homes in this land of beauty, the plea must be made that this is a concomitant of the old régime of large ownership and the renting system, and is rapidly passing away. Especially since the uprising of the fruit industry has the change been marked, and with each succeeding year the visitor will find more to praise and less to deplore in the Californian rural homes. As for barns and outbuildings, there is no excuse, of course, for ugliness or lack of neatness; but the visitor should remember that the climate favors an all-the-year outdoor life for farm animals. Protection from storms and comfort from such degrees of inclemency as prevail here is humane and profitable as well, but we shall never need the commanding structures of wintry climates. According to the climatic conditions, the improvement of outbuildings on our farms has been as rapid and satisfactory as that of the rural dwelling.

Ever since the shipment of Eastern-made implements to California began, extra sizes and strengths for the Californian trade have been the rule with the manufacturers. Wagons had larger boxes and stronger running gear, plows were set in gangs, reapers and headers had longer sickle bars, and threshing machines were of colossal breadth and stature. The secret of it all was to secure the results of a maximum horse power with a minimum of human guidance. Nor could Eastern manufacturers sufficiently answer this demand in all lines. Local manufacturers of gang plows, harrows, cultivators, threshing machinery, and other implements and machines were established to meet the requirement, which was, that one man might cover the greatest breadth of plowing, harrowing, cultivating, and threshing possible with as many animals as he could control with rope or thong—it mattered not how many. Our great grain fields, level as the sea, favored the most ponderous and complicated constructions which could be made effective. The acme in this direction was reached when the "combined harvester" made it possible for three or four men to use the strength of two or three dozen horses in cutting, threshing, cleaning, and sacking grain as fast as the great machine moved over the field. However strongly it may be asserted that all these capacious appliances secured quantity of work and of product at the cost of quality, it must still be insisted that they were all in accordance with the requirement of Californian conditions and the exigencies of the crop and the market, and without them California could not have recorded her grand surpluses for shipment. Though natural and trade conditions may be changed as the State develops, and producing policies and methods may be modified to suit the new conditions, the old systems are true to the unchanged conditions, and are therefore to that extent sound and consistent.

The speculative disposition of the old school of Californian farmers was a product of the times and environment in which they began. That the same disposition was carried over into the later period was unavoidable. That it has been almost squeezed out of the industry by the hard times of the last few years is fortunate for the agriculture of the State, though it has given sad experiences to many estimable people. There should be the kindest sympathy expressed for those who cherished the old misapprehension. Their example led others into losses, it is true, but they commended nothing to others which they did not themselves practice and suffer for. At present there is throughout California quite a strong caution and conservatism as the most exacting could desire, and there have been efforts for thrift and frugality as strenuous as people unused to such things could possibly make. There is at present no occasion for denunciation of speculative disposition among Californian farmers; it has been fully expiated.

As this must be conceded, it follows that much of the old yearning for "something great" in productive effort has departed also. There are, of course, clear producing and selling advantages in plans which yield certain volumes of produce, and in this line California will probably always have record. Our producers will have no greater difficulty in coming down to proper dimensions in this regard than older settled States may have in coming up to them, by better organization to secure uniform results for many small producers. As already shown, extravagant anticipations and other products from enlarged cranial development have largely passed from our agricultural horizon.

The peculiar natural endowments of California make it necessary, as has been intimated, that this State must devise and cling to policies and practices which may in some cases seem ill advised to people of different environment. It is possible to fill a book with accounts of local practices in the various branches of agriculture. These are the secret of success and satisfaction here, and the newcomer must learn them. Above all things, he must first learn that it is impossible to expect any certain procedure to prevail in all parts, even of this single State. To indicate how striking are the differences in successful practices, three which are most freely condemned by Eastern critics may be cited.

Let it be declared then, first, that it is not always wasteful to burn the straw in the field. It cannot be plowed into light soil under a scant rainfall, because it would be plowed out again, as bright as when it was covered in, and meantime it has rendered the land unproductive because it has increased the nonretentiveness of the soil, so that not enough moisture remained to mature a plant. It cannot be rotted in the stack, for lack of moisture. It cannot be fed to stock, because no man can afford to keep stock merely to

burn straw in their lungs part of the year, enless he is near the pasture lands of the hills or the river bottoms,—and he may be twenty-five miles away from either. Consequently he burns the straw, saving the ash ingredients for the land, regretting the loss of the nitrogen which he cannot save, but rejoicing at the same time in the cremation of Hessian flies, joint worms, and grain aphis which he is well rid of. Thus he clears his fields of what under his ruling conditions is only rubbish, and prepares to start again his great teams and tools in preparation for another crop.

And now he commits the second great sin of the Eastern critic: He "merely scratches in his grain!" What could be clearer demonstration of the slipshod character of the large scale of work? Just look at the work of the fourteen-gang plow which an eight-mule team draws over the field, working at each crossing a strip wide enough for a county roadway and less than a finger's length in depth; or suppose he uses his wide three-section disk harrow or cultivator to make his seed bed! Or, shade of the great Mecchi, suppose he makes no seed bed at all, but sows his seed on the surface and covers it with a harrow! Or, pinnacle of absurdity, suppose he merely scatters a little more seed and lets the whole thing go for "volunteer!" How our Eastern friends have berated Californian farmers upon all this shiftlessness! And yet it must be held that there are conditions under which all these practices are perfectly rational and profitable, and they are not to be either commended or condemned, except one fully knows and understands the conditions themselves. It would pass present limits to discuss them.

But there is another point at which California's large-scale work is arraigned, and that is the manner of summer fallowing. In summer-rain countries the "bare fallow" (or land which is fallowed at intervals for one year without sowing of crop) has been shown to be of so little account that bare fallowing has been abandoned. The well-informed Eastern farmer can therefore hardly contain himself as he looks from the car window upon whole sections of land lying in bare fallow. Of course he must denounce the Californian grain grower as behind the times and shiftless. But the fact is, that the well-cultivated bare fallow is the sheet-anchor of success over the greater part of our grain area. At present there is no rotation open. It is impossible to grow a crop to reap and a green crop to plow in—there is scant moisture for one crop. The action of the atmosphere on the bare fallow adds something to the soil by progressive disintegration of its insoluble ingredients, but the chief value of the summer fallow in California consists in giving one crop the rainfall of two seasons. The land is fitted to absorb all the rain that falls, the maintenance of a loose, clean surface prevents evaporation, the early sowing gives the plant a long growing season, and the result is that grain on summer fallow makes a crop, even though the rainfall during the seasons of its growth is scant. Thus the bare fallow becomes the surety of a crop, and is strictly rational under Californian conditions.

These three strange practices of Californian grain growers could be matched by others equally strange to Eastern eyes from other branches of our agriculture. As stated at the beginning, we have to request from Eastern visitors the charity of silence about our strange ways, until they can carefully decide whether the reason for our peculiar agricultural manners is in our lands or in ourselves.

Alfred Holman

Our "cup of gold," held by gentlest Spring
To drink a welcome to those wandering
In our fair land.—Even cloud and pine confess
Their homage to the meadows' sunniness.

DISTINCTIVE FEATURES OF CALIFORNIA HORTICULTURE.

By E. J. Wickson, Professor of Agricultural Practice in the University of California.

THE uniqueness of California is striking from every point of view of history, geography, climatography, sociology, and industry. In all these phases of nature and development there are peculiar local requirements, conditions, and adaptations, which affect the thought, behavior, and industrial methods of the people.

It is not strange that persons who are literally dropped from the clouds into this peculiar country for the first time should find it difficult to understand and to appreciate the significance of all the unaccustomed things they see in the life and activities of Californians. It is hard for them to realize that things so unusual should be true and consistent. If they reflect, however, that what they see of mental attitude and manual method, in industrial affairs at least, is the accomplishment of the American mind, with all its resources of insight, acumen, and ingenuity brought to bear upon new materials and under novel natural conditions, they should at least have respect for results, though they may not at first understand them.

It is an interesting fact, that it was in California first of all that the American mind came into contact with arid, semitropical conditions. It is surprising with what rapidity American insight reversed the Spanish conception of the value and adaptations of the country, and American energy and ingenuity made practical and profitable use of them. It is interesting, also, that the results thus accomplished are so widely significant that all the civilized, semitropical countries of the world are seeking to sit at the feet of Californian demonstrators of principle and method to catch hints for the higher development of their own lands.

Although these reflections are true of all our agricultural achievements to an extent not generally known, it is especially the horticultural resources and practices of California that attract world-wide attention. They afford the sharpest contrasts when compared with the natural endowments and traditional methods of northern countries, and they furnish the most direct and practical suggestions for successful operation in all countries of similar climates in all parts of the world. For these reasons, during the last decade, California has been officially inspected by expert commissioners accredited from all the governments having possessions in arid, semitropical climates on all the continents of the Eastern Hemisphere, while the pomological and horticultural societies of the States east of the Rocky Mountains have brought their membership *en masse* to inspect and investigate Californian conditions and procedure. The result is, that California is at the present time the most eminent fruit region of the world. Californian methods are imitated everywhere, to a greater or less degree, as local conditions admit them, and fruit varieties of Californian origin have been disseminated to the uttermost parts of the earth.

It is hopeless to expect to satisfactorily dismiss in a few paragraphs a subject of such breadth and with such a wealth of interesting details. The discussion must be resolutely restricted to a few of the most conspicuous phases, selected because they embody striking differences between Californian adaptations and methods, and those of nearly the whole country outside of our own State lines; for though the more northerly portions of our own coast have some characters resembling ours, the points of difference are greater than the resemblances, and there are unavoidable limitations to their enjoyment of our breadth of resources, and adaptations, and prohibitions to the use of much of our most valuable material. Nor will it be possible to mention the converse of the propositions which will be made. The reader must be trusted to know the conditions of his own locality, and to measure them for himself by means of the Californian standards which will be set up.

In climatic conditions affecting horticulture, California is almost an epitome of the whole United States. We have high mountain valleys with wintry temperature-conditions,

where only hardy northern fruits can be grown; but even there we have no need of "iron-clad" varieties, because the temperature never falls to the point of tree-killing. On the other hand, we have hot valleys where the date palm confidently lifts its head to the fiery sunshine, while its feet are deeply planted in moist substrata beneath the sandy surface; but we cannot claim tropical conditions, because our dry air denies us many strictly tropical growths.

Intermediate between the cold and snow of the mountains and the heat and sand of the desert, we have every describable modification and gradation, and, naturally, it is between these extremes that our richest inheritance of horticultural adaptation lies. It is this infinite variety which gives us true title to the term semitropical.

When this breadth and scope of our horticultural adaptations is realized, it becomes apparent that any enumeration of the fruits we can grow successfully would fill pages, and be, in fact, a catalogue of the known fruits of the world, except those which are strictly tropical. Wherever there is a northern or southern departure from the equator sufficient to bring energy to mankind, or where the same is accomplished by elevation upon tropical mountain side or plateau, there also are fruits which find a welcoming home in California, and are improved by the intelligent cultivation and selection which here prevail. On the other hand, it has been abundantly demonstrated, during recent years, by official awards at great exhibitions and by the sharp criteria of the markets as well, that the fruits of wintry regions are quite as much benefited by transfer to proper locations in California as are the people who come here to grow them. From north and south alike, then, California makes grand acquisitions, and includes within her area the adaptations of the whole country, with some which no other State possesses.

But while this horticultural scope is claimed for the State as a whole, it is necessary to add that local adaptations within the State must be very narrowly drawn. Our greatest failures have followed ill choice of location for the purpose intended. Whenever certain Californian fruits have been ill spoken of, they have been produced in the wrong places, or by ill-advised methods. It is possible, then, to produce both poor and perfect fruit of a given kind. It may be said this can be done anywhere by the extremes of culture and neglect, but to this proposition it must be added that in California equally excellent methods and care will produce perfection in one place and the opposite in another. One who seeks to know California well must undertake to master both its horticultural greatness and littleness; and so closely are these associated, and so narrow the belts of special adaptations, that there are many counties which have a range of products nearly as great as the State itself.

It is hard for the stranger to realize this. It is difficult for him to believe that the terms "northern" and "southern" have almost no horticultural significance in California; that northern fruits reach perfection, under proper conditions, at the south, and *vice versa;* that some regions of greatest rainfall have to irrigate most frequently; that some of greatest heat have sharpest valley frosts; that some fruits can be successfully grown through a north and south distance of 500 miles, but cannot be successfully carried a few hundred feet of either less or greater elevation; that on the same parallel of latitude within a hundred miles of distance, from coast to mountain side, one can continuously gather marketable Bartlett pears for three months—not to mention the second crop, which is often of account on the same trees in the same season.

Through the multitude of local observations, which seem perplexing and almost contradictory, it is possible to clearly discern certain general conditions of both nature and culture, which may be briefly advanced as characteristically and distinctively Californian. Of these, perhaps the most striking is the length of the growing season.

Take, for instance, the peach in a good peach region. The bloom appears in February, followed by the grand foliage expanding to a leaf-size, marvelous to one unused to such peach leaves. The shoots of new growth rush out with vigor, promised by such a leaf, and yet the fruit below expands as though it would burst its skin in rapid enlargement—and still it grows. The new shoot, apparently weary of its several feet of extension, stops for a rest, and then, reviving, starts out its laterals—while still below the peach is growing. The laterals push out a foot or more—all carrying large, fresh leaves. While these are in full vigor, the fruit ripens, after having a full half-year's joint work of root and foliage, if it is a late variety. Is it any wonder it weighs a pound? But still the tree is

active. It forms its terminal buds, and then all along the new main shoots and their laterals are formed the leaf and blossom buds for the following year. Still the foliage holds green and active, if the moisture below be adequate, and the leaves seem loth to fall in the ninth month from the time of blooming. Is it any wonder Californian peaches are large and the trees require pruning and thinning to enable them to carry the weight produced in such a season of growth? And what has been said of the peach is true of other trees, according to their nature and habits. The trees themselves are more eloquent of California's conditions for growth than descriptions or statistical tables can be made.

But the quality of the light and heat, if the term is admissible, is a factor as well as their duration. The air, free, not alone from clouds, but from the insensible aqueous vapor which weakens sunshine in its effort to serve vegetation in a humid climate, has a clearness and brilliance from its aridity which makes each day of the long, growing season more than a day in other climates, and thus adds to the calendar length of the growing season. The surplus light and heat also act directly in the chemistry which proceeds in the tissues of the plant, and we have not only size, but quality, color, aroma,—everything which makes the perfect fruit precious and beautiful beyond words.

It is true that for commercial purposes it is not possible to allow this process to go too far, for its later effects are higher sweetness, accompanied by such juiciness that the fruit cannot endure transportation. But go to the tree to apply the only test which can be fairly put to a juicy fruit, and the demonstration of the service of clear, unobstructed sunshine through an adequate period is complete. But if this cannot be done, place the judgment upon the mature peach carefully sun-dried and intelligently cooked, or upon the ripe peach skillfully canned, and the distinctive adaptations of California for fruit production will display themselves.

But there are other agencies involved in the perfection of fruit than intensity and duration of heat and light. Without adequate moisture in the soil, the air which we have credited with such benign power in carrying heat and light for perfection of fruit would transmit the same as agencies for the destruction of the tree which bears it. If this moisture come from rainfall, it descends at the time of the year when the tree is least active, consequently is least retarded by a clouded sky and moisture-laden air, and least affected by atmospheric disturbances. Strong storm winds find the tree with reefed sails, and able to endure pressure which would tear it to pieces if they came upon its grand spread of foliage on branches heavy with fruit. It is a priceless horticultural endowment that no tornado can pierce our protecting mountain-barriers, and that it is exceedingly rare that our local winds disturb the confident swaying of the branches and leaf movement beyond the activity which ministers to the sap flow. And if the adequate moisture is not from rainstorm, but by irrigation, the same facts remain, for the water reaches the tree without interrupting its aërial activity. Temperature is maintained, light is unobstructed, and the tree is refreshed with moisture without the chill and darkness which favor fungoid parasites. Of all the ways by which moisture could come to soils supporting fruit tree or vine, the natural by its time, and the artificial by its method, endow California with the best.

At this point the skill of man enters as the ruling factor. The Creator planted no fruit trees upon the valleys where now the greatest crops are borne. If they should be planted, trusting to the winter rains or to the summer overflow of the rivers, these supplies would avail them nothing. Adam is as necessary to California as he was to that older Eden in that other arid, semitropical country in Asia Minor. In nearly all valley and foothill situations diligent cultivation is the price of life and productiveness in the tree, and pruning is the secret of its strength and symmetry. Hence has arisen the reputation of California in these important lines of orchard and vineyard work, and within the last few years the example of California has led the older States to the beginning of a new era in their own horticulture and in their treatment of so-called "hoed crops" as well. The basic principle is the stirred surface, to check evaporation, to promote retention of moisture in the lower strata, and the deeper rooting of plants to enjoy it. California did not discover the principle. It was inscribed in books before California was thought of, but California found, first, that the survival of the plant depended upon it; and second, that survival on that basis meant the highest excellence. In humid climates the question of survival is not involved, but the superior excellence of the cultivated orchard is becoming

so clear that the old cow-pasture orchard is being remanded to its proper place among the picturesque ruins of a former time. California, in achieving her own success, has brought the older States up to date in rational horticultural practice.

There remains still another distinctive character among California's horticultural adaptations. Equable temperatures, unequaled light and heat, adequate and timely moisture, the highest human insight in location and skill in maintenance—all these would fail of success were not the ultimate foundation of horticulture, the soil itself, of commensurate excellence. Thus, indeed, it is. Our fruit soils in all parts of the State are characteristically deep, rich, and mellow. Systematic examination and comparison with the soils of humid climates have shown exactly and indisputably that an arid climate favors retention of plant food in the soil, and that we have in our deep surface strata a wealth of fertility which the rains of a humid climate would have been for centuries carrying to the ocean.

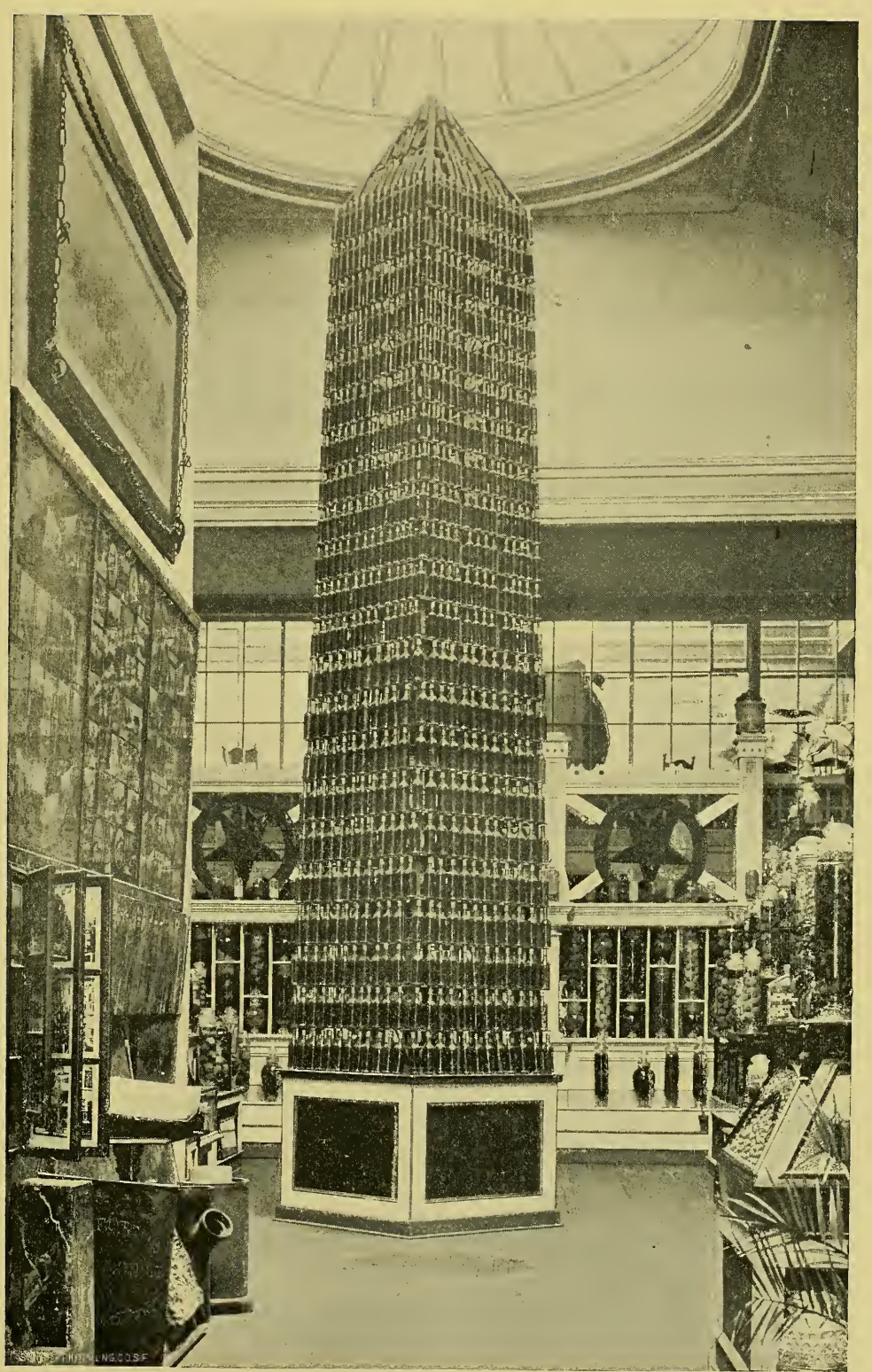
Both the depth and the richness are cofactors. In our best valley situations the soil is practically the same at a depth of many feet as it is at the surface. The roots of fruit trees and vines proceed almost indefinitely downward, finding moisture and food all along their course. Even light sandy soils, which in humid climates would be almost barren, may be found in California abounding in fertility, and the finer loams are proportionally better. Of course, the almost infinite diversity of Californian conditions extends to soils as to other natural materials, and there is not depth nor richness everywhere, nor can the newcomer always judge of their presence by the criteria he has applied in other lands, but the trees and their fruits will give him unmistakable evidence.

The standing horticultural injunction of other lands, to put your trees on the best soils you have, and then tuck them in closely beneath blankets of the best prepared fertilizers, is not a good general rule in California. It would be mistaken kindness in many places. We really have soils too rich for fruit trees and vines, unless one is content to wait for years later than the usual early-bearing time, until the tree has passed its youth, in riotous living and astounding wood-growth. There are wide seas of land which is in midsummer brown and bare, but conceals beneath its forbidding surface such depths and richness that a quarter of a century of constant fruit-cropping would not perceptibly sap its strength. Possibly within gunshot, however, are other lands which could hardly bring trees to satisfactory bearing age. Here, too, California has rewards for the highest human skill and knowledge, and disappointment for ignorance and carelessness.

In these few paragraphs it has been freely intimated, and the widest observation among our people will confirm the declaration, that the swift advance and unparalleled achievements of Californian horticulture are due not more to the characteristic fitness of her natural resources of climate and soil than to her endowment of human skill, knowledge, and enterprise. The fruit-growers of California, as a class, are the most intelligent and most highly-educated group of agricultural producers in the world. They have come from all civilized lands to take up residence and investment here, and the ability to come so far on such intent is *prima facie* evidence of the possession of personal quality and resources of distinguishing character. They have come bearing the fruits of successful enlistment in all the professions and callings of mankind, and their trained minds and quickened powers of observation have constituted the impelling force in California's wonderful progress during the last two decades. They have pushed our fruit colony hamlets into cities; they have extended and enriched our school system; they are the most earnest promoters and patrons of higher education; they have no fear that their sons and daughters will be too highly educated for the intelligent pursuit of horticulture; they are developing the commercial features of our fruit industries; they are constantly improving our culture methods; they are actively appreciative of the application of the sciences to their pursuit, and they are very quick to detect pretension and fallacy.

The gift of the fruit interest, then, to California is not alone the wealth which can be calculated as the value of outward shipments; not alone the wonderful accretions on the county assessment rolls of improved property. The greatest gain to the State is in the line of higher citizenship, and, in fact, it is this acquisition which has rendered all the other gains possible.

E. J. Wickson



PYRAMID OF OLIVE OIL — STATE BOARD OF TRADE EXHIBIT.

OLIVE CULTURE.

By Elwood Cooper, of Santa Barbara.

THE Franciscan Fathers planted the first olive trees in California. These trees were planted at every Mission, and the fruit harvested was converted into oil, a large quantity of which was used in the religious services of the church. It was also consumed as a food product. Until 1868 the culture of the olive was confined to the Missions, and even in those orchards no effort was made to enlarge or extend the cultivation of this fruit, destined, in my opinion, to become the basis of California's leading industry.

Early in April of 1868 I visited Santa Barbara and saw the Mission olive orchard. Even at that season, late as it was, the trees were hanging full of fruit, and I was so impressed by the beauty and apparent productiveness of the orchard, that two years later, when I had decided to make California my home, I began at once to prepare for olive growing.

I believe the time will come when all the table-lands, hills, and mountain slopes will be planted with the olive. Many other fruits will be rooted out to give it place. Every available acre will be required for this industry, and no substance will enter more largely into medicinal preparations than olive oil, and none be more common as a food product in daily consumption.

Olive planting is inexpensive, because trees can be raised from slips and cuttings, which grow rapidly if properly manipulated. If grown from cuttings, the plants will produce fruit the fourth year. Trees can also be grown from seeds, and it is claimed that from this planting the best trees and fruit are produced. By this method, however, it takes about twice as long to get the first fruits, with the additional expense of either budding or grafting.

My experience with the olive indicates that it will thrive on every well-drained soil. On my ranch the trees have been planted in black adobe, on sandy loam, subsoil brick clay, on deep bottom land, on sandy and stony hillsides, on adobe hillsides, on clay soil, and on red lands. All are thriving, and those planted on the higher lands are apparently the more thrifty; the highest elevation, however, is not over 400 feet above the sea level, and is distant from the sea less than three miles. The tree will grow in a dry climate where no other fruits could be successful, and will live through an extremely dry year; but it could not be expected to give much fruit in such years, nor is it known just how long thereafter the tree will recover from this lack of moisture. I have not found irrigation essential or at all necessary to the production of the best olives.

It is believed that the olive will thrive in nearly every part of the State. On the coast it is claimed that the tree will grow more rapidly and bear more abundantly; and while this is conceded, inland growers claim an equal advantage from the circumstance that insect pests and fungoid diseases are less prevalent.

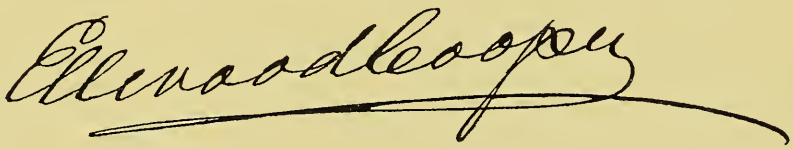
Opinions are at variance regarding the variety of olive to plant for profit. Formerly the Mission olive was the only variety planted. My own planting was from cuttings of the Missions of Santa Barbara, San Fernando, and San Diego, and from the Tajiguas Ranch. In recent years many different varieties have been brought from Europe. These imported varieties have been planted and are fruiting, so that the question of their relative values will soon be determined by the experience of olive growers in California.

In the selection of varieties, a rapid-growing tree, easily shaped, is a very important feature, as it gives good bearing capacity. Some varieties grow unshapely, and are with difficulty kept from breaking. Different locations may require different varieties, but above all other considerations is the quality of oil produced. The varieties that will make the best oil should, in all cases, be selected, provided the quantity is a fair average to a given acreage planted. The quantity and quality of the oil in the fruit gives value, also, to the pickles.

Making olive oil is a simple process. The quality will depend upon the care that may be exercised, from the picking of the fruit through every stage of the manufacture, until it is tightly corked in the bottle. The berries must not be allowed to stand in heaps, or in sacks, or, in fact, in any sort of package, long enough to heat; otherwise the oil will become musty or rancid.

The quantity of fruit that a well-grown olive tree, from twelve to fifteen years old, will produce in a good year, is from 200 to 250 pounds. The results in the oil product from these trees should be eight and a half pounds of berries to the large bottle of oil.

The increased demand for ripe olive pickles has given encouragement to the olive growers. The importance of this fruit in the form of pickles, as a food, is growing in favor, and if proper care is taken to place them on the market well cured and in sound condition, the consumption will increase more rapidly than the supply, and give a much better result than if made into oil. As long as adulteration is permitted, or as long as consumers can be deceived by the adulterations and substitutes of oils that can be produced at so much less cost, the competition will be such that the pure olive oil cannot be sold at a profit to the grower. It is hoped, however, that the true character of these substitutions and the danger of using them will be clearly demonstrated to the public, as well as the great value of the pure olive oil as a food and medicine.



CITRUS FRUIT CULTURE IN CALIFORNIA.

By I. N. Hoag, of Redlands.

THE culture of the orange and the lemon in California became a recognized industry between 1860 and 1870. Previous to that time these trees had been planted, for the greater part, merely as handsome ornamental adjuncts of gardens and parks. Now these fruits are grown in every county along the foothills of the Sierra Nevada, from the Mexican line to Red Bluff, in Tehama County, a distance of more than 700 miles. This strip of country is called the thermal belt, and varies in width from a few miles to thirty or more. The area of this region contains about 1,500,000 acres of citrus fruit lands, in a climate adapted to the culture of this product.

Los Angeles and San Bernardino counties are credited with producing the first fruit of this character for commercial purposes. The counties shipping citrus fruits at the present time, in greater or less quantities, are, San Diego, Riverside, San Bernardino, Santa Barbara, Ventura, Orange, Los Angeles, Tulare, Fresno, Sacramento, Placer, Yuba, Butte, and Tehama. California's average output in oranges and lemons for shipment is about 12,000 carloads, or 3,600,000 boxes. There are no trees in the State old enough to be in full bearing, and this condition will not ensue for fifteen to twenty years. The aggregate of orange trees planted in orchard form is about 8,000,000, and of lemons about 1,500,000. One third of these are bearing more or less, averaging a box a year from each tree; one third are just coming into bearing, and one third are not bearing at all.

The citrus belt is on upland, or, as it is termed in California, *mesa* land. The altitude ranges from 300 to 1800 feet above sea level. The soil is largely decomposed granite, and much of it is mixed with red or black clay. Very little is river-bottom land.

To produce this fruit irrigation is necessary. In some sections large storage reservoirs have been built high in the mountains, and from these water is drawn as needed to supply the distributing reservoirs on the foothills. As they gain experience orchardists are learning that better cultivation is an effective substitute for water, and produces better quality of fruit in larger quantities.

If the rich alluvial soils of the river bottoms could be transferred to the elevated slopes of the foothills, they would make the best citrus land. They cannot be utilized for that purpose in the low levels, because of liability to killing frosts, and because of lack of good drainage. Citrus fruit trees require a deep soil. They will not do well if the subsoil is a hardpan on gravel beds.

The mean summer temperature of the citrus-growing region of California is sixty-eight degrees at San Diego and eighty-eight degrees at Red Bluff. The mean winter temperature is fifty-four degrees at San Diego and forty-five degrees at Red Bluff. Neither oranges nor lemons can be profitably grown in a climate where the temperature falls much below the freezing point and remains there more than a few hours at a time.

The mild and even climate of the Pacific Coast is due to the prevailing ocean winds from the southwest in winter and from the northwest in summer. Along the thermal belt, in a normal condition of the atmosphere, two calms occur every twenty-four hours — one about ten o'clock in the morning and the other at ten o'clock in the evening. During the morning calm the sun warms the atmosphere until it begins to rise, and the cooler air of the ocean moves slowly inland. The warmer air, high above, also moves inland, and finally rests against the slopes of the mountains. In winter this warm atmosphere presses the cooler air of the desert back beyond the mountains. This condition, and the motion of the atmosphere, continues until the sun begins to set. Then contrary influences begin to operate. The inland movement is checked, and the second calm ensues. The cool stratum of air that has rested on the foothills recedes. The upper strata of heated air is also drawn back, and a light wind blows seaward all night, with a temperature somewhat lower than that which moved inland during the day. At sunrise, before the returning tempered air has passed the thermal belt, and when the temperature is about to be lowered by the frosty air of the mountain tops, solar radiation has arrested the downward tendency, and the first calm of another day has set in.

In those citrus sections most highly improved the land holdings average about ten acres to the family. An orchard well cared for will pay running expenses the fifth year after planting, and will be a profitable investment in the seventh year. Thenceforward the orchard will increase in product and profit until the trees are fifty years old, and they may be in full bearing at one hundred years.

The cost of a profitable orchard depends upon many circumstances. In Redlands and some other sections of Southern California, where land has always been held at a high figure, and where water is distributed through underground pipes to the most elevated portion of every orchard, and where every other appointment is necessarily on an expensive scale, the average cost of orchards at seven years is from $750 to $1000 an acre. In localities where land and water are still cheap, where water is delivered direct from rivers through open ditches, as in the upper San Joaquin Valley, the cost of orchards at seven years will not average over $500 an acre. In either case the average income will not be less than ten per cent. on the investment, per annum; and may be much more under favorable conditions.

There are various opinions as to the best varieties of citrus fruits. The standard varieties of lemons are the Lisbon, the Eureka, and the Villa Franca, and general preference is given in the order named. The standard varieties of oranges are the Washington Navel, the St. Michael, the Valencia Late, the Bloods, the Mediterranean Sweets, and the Seedling. On account of the superior quality of the Navels grown in this State, California has a practical monopoly of this favorite in the markets. The St. Michael, however, is one of the best oranges in the world. The Valencia Late is also a good orange, and as both ripen late, and can be kept on the tree until May or June without injury, or can be kept in cold storage until August or September in prime condition, they offer a safe opportunity for certain profits. The Bloods, both Maltese and Ruby, are great favorites as specialties, and may be depended upon for good returns. The same results may be expected from the Tangierines.

In California the orange, lemon, and grape fruit are, as a rule, propagated by budding on the orange stock. Trees propagated in this way have very few natural diseases, perhaps less than any other kind of fruit trees. Such diseases as do appear are generally caused by bad management—the trees may have been watered too much or too little; or the drainage may have been inadequate. Citrus fruit trees will rapidly deteriorate by reason of neglect or bad treatment, and they will as rapidly respond to good care.

Citrus trees are liable to be attacked by scale insects, especially in damp or foggy climates. The most dangerous scale is the white cushiony and the black scale. The *Vedalia cardinalis*—a ladybug from Australia—has almost exterminated the white scale in California, and growers no longer regard that pest with apprehension. The *Rhizobius ventralis*, another Australian ladybug, is proving very efficient against the black and other scales.

Perhaps the most interesting and important feature of discussion regarding citrus fruits in California at the present time is the question of protection from injurious competition by reason of the importation of foreign fruits into this country in such quantities and of such inferior grades and condition as to demoralize the market for our own production.

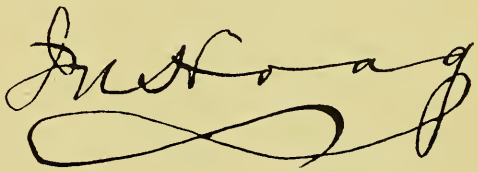
The fact that tariff duties have in the past been imposed on citrus fruits by the box and in bulk, while on the other fruits these duties have been laid by the pound, seems to have blinded growers, dealers, and legislators to the great discrimination in favor of foreign growers and importers of these particular fruits. Past legislation in this regard has been a cordial invitation to Spain, Italy, Sicily, the West Indies, and Mexico to extend their plantations, and usurp and hold our markets as against our own growers and dealers. The rapidity with which these plantations have been multiplied and the rapid increase of importations during the past few years, indicate that this invitation has been accepted and acted upon.

The strong protests made by these foreign growers and importers, and by their governments, show that they have come to regard the privilege they have thus enjoyed, through our default, as a right which they think we are bound to respect. When, however, it was pointed out what an insignificant figure ten cents a cubic foot under the McKinley Bill and eight cents a cubic foot under the Wilson Bill amounted to when the contents of the cubic foot was reduced to pounds, and the duty was reduced in like proportion, namely: two sevenths of a cent a pound under the former bill, and a trifle over two eighths of a cent a pound under the latter bill, the inadequacy of this duty as a revenue measure even was readily seen and acknowledged by all.

The Ways and Means Committee promptly changed the schedule and reported three quarters of a cent a pound. This is not enough to make a good revenue rate, but it is much better than the old rate. As a measure of justice to the citrus growers of California, the schedule should fix a rate of at least one cent a pound on this product.

The best interests of the consumers of these fruits on the other side of the continent will also be served by encouraging the development of this great industry in California, for these consumers will, as a consequence, receive more extensive orders from the people of this State for the products of Eastern shops and factories.

Therefore, aside from immediate individual advantage, is it not the patriotic duty of every citizen of the United States to uphold and strengthen the industries and the prosperity of his own country in preference to those of any other?



CALIFORNIA.

A sleeping beauty, hammock-swung
  Beside the sunset sea,
And dowered with riches, wheat, and oil,
  Vineyard and orange tree;
Her hand, her heart to that fair prince
  Whose genius shall unfold,
With rarest art, her treasured tales
  Of life, and love, and gold.

—*Clarence Urmy.*

THE BEET SUGAR INDUSTRY.

By Claus Spreckels.

EXACTLY 150 years ago the first experiments in extracting sugar from beet roots were made by a German scientist named Margraff, who prophesied that Europe would find in the beet the basis of a new industry. The chemist in his laboratory was the pioneer of the manufacturer, and the immense production of beet sugar in Europe, at the present day, attests the correctness of Margraff's forecast. When this discovery was first made the beet contained only about five per cent. of sugar; to-day, in California, it contains fifteen per cent.

No sooner did man discover the latent value in the plant than the plant rewarded him by doubling and then trebling the cherished characteristic. The beets themselves became sugar makers, and repaid abundantly whatever labor was expended upon them.

The great importance of this growing industry to California will be clearly apparent from a survey of the facts.

Ten years ago it was in its infancy. The three factories now in operation at Watsonville, Chino, and Alvarado produced during last season 35,000 tons of sugar—a quantity sufficient to supply half the requirements of the Pacific Coast. Two other factories are now in course of construction, one at Alamitos, another at Salinas. When these are completed the supply will exceed 100,000 tons. Large as this quantity is, it is small compared with the possible production in California—as there are 750,000 acres perfectly adapted to the raising of sugar beets. Allowing for proper rotation of crops, about 200,000 acres would be available each season, capable of producing 2,500,000 tons of beets, and 350,000 tons of sugar.

Last year the United States imported over $90,000,000 worth of sugar.

The successful development of the beet-sugar industry in various sections of the country has demonstrated, beyond dispute, the ability of the nation to produce all the sugar it needs. The same process will be repeated on this continent that has taken place in Europe—the consumption of cane sugar will become less and less, as the development of the beet industry enlarges. The entire annual production of cane sugar throughout the world is now less than 3,000,000 tons, whereas Europe produces nearly 5,000,000 tons of beet sugar. Thus the sugar trade has been almost entirely revolutionized in the old world, and it soon will be in the new.

As the annual consumption in the United States is about 2,000,000 tons, there is abundant scope for the development of the home industries.

Many sections of the country are well adapted for the raising of sugar beets, but California surpasses all other States in possessing a combination of all the conditions suitable to the industry—whether as regards soil or climate. The length of the season enables the beets to ripen and the crop to be harvested earlier than elsewhere, an advantage both to the farmer and the manufacturer. The mildness of the winters on our coast renders it unnecessary to store the beets in silos, an item of expense that must be incurred wherever the winters are severe.

The best proof of the superiority of California in beet raising is to be found in the beet itself. Comparative statistics show that the proportion of saccharine is greater in the beets grown here than in any other locality, whether in America or Europe. The plant itself becomes a more active worker, and extracts more sugar from Californian soil and sunshine than it does elsewhere.

Taking the actual results of an entire season's operation at Chino, the average yield of raw sugar exceeded 15 per cent. of the weight of beets supplied to the factory, whereas in most other States the yield rarely exceeds 13 per cent.

This State needs men who are willing to work on farms, and there is no better field than in the raising of sugar beets. Given the necessary care in cultivation, there is an assured market for all the beets that may be raised in the vicinity of a sugar factory. Contracts are made which guarantee the payment of $4.00 per ton for beets delivered at the factory.

Land adapted to sugar-beet growing will average fourteen or fifteen tons to the acre, from which the farmer will realize about $60. The cost varies with varying conditions and localities, but will in general range from $30 to $40 per acre. The farmer will thus

net from $20 to $30 per acre on his crop. No grain crop can be compared with the sugar beet for results. A single example will suffice to show this. A particular tract of 225 acres planted to barley returned $12.75 per acre, but when planted to beets netted $59.33.

Last season's operations at Watsonville show an average of $56.24 per acre, gross returns, on the whole crop of over 150,000 tons. The average tons raised to the acre were slightly in excess of fourteen, and the price paid $4 per ton. The sugar produced amounted to nearly 20,000 tons.

When the factory at Salinas is completed next year, we will be able to utilize the product of 30,000 acres. This area under beet cultivation will entail an expense of $22 per acre for labor and seed, aggregating $660,000. Sown in grain, the outlay would be under $160,000. The factory will have a capacity for crushing 3000 tons of beets and turning out 500 tons of sugar daily. This is equivalent to a production of 60,000 tons of sugar for the working season of five months. When in full operation the daily disbursements will amount to $12,000 for beets, and $5,000 for labor and operating expenses—a total outlay for the season of fully $2,000,000.

No better field for colonization was ever offered than California offers through her beet-sugar industry. For many years to come its expansion is assured—the market is constant and reliable—the profits are good. One thing is necessary—union. The coöperation of the manufacturer and the agriculturist is essential to success, and the heartier the coöperation the greater the success. The factory is the nucleus of the community,—the beet fields and the various allied industries are grouped around it. The farmer is not entirely dependent upon his crop of beets, but that crop is certain of an adequate return. Parties of colonists would, therefore, find one element of success permanently present as soon as the acreage planted to beets was large enough to warrant the erection of a factory. This, capital is ready to do whenever the opportunity presents itself.

Plans are now being carried out in this State, whereby large numbers of unemployed men will be enabled to earn a comfortable living, and if industrious acquire homes of their own.

The success that has thus far attended this effort to aid those who were unable to aid themselves, abundantly proves the certainty of success which awaits those who come to this State, possessing such means as will enable them to take up land in beet-raising districts, and who are prepared to contribute their intelligent labor to the development of the industry.

Below will be found a statement of the cost of raising, and profits derived from a beet farm located near San Juan, California.

		Total Cost.	Cost per acre.	Cost per ton.
EXPENSES.				
Rent of 238 acres at $7.00 per acre		$ 1,666 00	$7 00	$ 37
First plowing	$340 00			
Second plowing	396 65	1,236 65	5 19	28
Cultivating and harrowing	500 00			
Sowing—labor	85 00			
Use of drill	28 80	113 80	49	03
Seed, 2830 pounds at ten cents		283 00	1 19	06
Thinning, 1100 days at $1.00		1,100 00	4 62	25
Cultivating and weed cutting, one man and two horses, thirty days at $3.00		90 00	38	02
Plowing out, one man and team, ninety-five days at $3.00		285 00	1 19	06
Topping and loading into wagons, 1335.3 days at $1.00		1,335 30	5 61	30
Hauling three miles to switch, at fifty cents per ton		2,225 50	9 35	50
Freight on railroad to factory		2,225 50	9 35	50
Cost of knives and hoes		20 00	09	
Interest		300 00	1 26	07
Total expenses		$ 10,880 75	$45 72	$ 2 44
INCOME.				
4,451.275 tons of beets, at $4.00		$ 17,817 22	$74 86	$ 4 00
Sale of beet tops		200 00	84	04
Total income		$ 18,017 22	$75 70	$ 4 04
Net profit		$ 7,136 47	$29 98	$ 1 60

Cost of labor done by farmers personally is estimated at current rate of wages.
Nature of soil.—Deep, sandy loam, on banks of San Benito River, not subject to overflow.
Previous crops.—Pasture for seven years.
First plowing.—In November, six inches deep.
Second plowing.—In February and March, ten inches deep.
Commenced sowing.—May 1, 1896.
Finished sowing.—June 3, 1896.
Commenced harvest.—September 8, 1896.
Finished harvest.—January 19, 1897.
Yield of beets.—18.70 tons per acre.
Rainfall for 1895–96.—22.05 inches.
Average pounds of seed sown per acre.—10.
Number of acres re-sown.—50.
Fertilizers used.—None.

In view of the new era that is opening for California, may we not look for such genuine prosperity in field, in farm, and in factory, that all eyes will be turned to this western edge of the world?

California is strong enough to stand erect, and does not need to make her obeisance toward the East, although she holds out a friendly hand across the Sierra. Confident that her welfare is based upon the freedom of her people, her public-spirited citizens will watch over it, and will seek to strengthen every industry that contributes to its preservation.

And whether a man's material stake in his country be large or small,—whether he has built up great industries or filled a simple task,—the results will be permanent and beneficent if each can look upon his work in the spirit shown in Millet's picture of "The Angelus," where the laborers rest from their toil while the church bell peals.

Hans Lyneck

THE RAISIN PRODUCT.

By William Forsyth.

THE State Board of Trade has requested at my hands a brief article upon raisin growing. The appeal is made to me in this relation because I am in the raisin-growing business, and have been since its inception in the raisin-growing district of Fresno. I am admonished by the committee of the Board to write simply and plainly, and from the mental attitude of one who may suppose himself to be answering questions asked by an Eastern visitor who desires to know something of how raisins are grown, and what profit may be expected from the industry.

I submit the following, not as a painstaking, profound-thinking essay on raisin growing, but as one wherein fine writing has been subordinated to plain speaking. I have avoided too great detail, and have simply sought to supply the inquiring visitor with general information, rather than exact *data* of the industry. I have, however, endeavored to treat the matter in a manner commensurate with its scope and importance.

First, a historic note: Raisins date far back of the Christian era in the world's history; but here, we of California present the marvel. Raisin growing was not suggested as an experiment earlier than 1876, and at that time no one foresaw the grand importance of that industry to this locality, nor what its future would be. It was in that year that experimental vineyards were planted, with the view of raisin growing, but it is fair to say that it was nearly ten years later before the importance of the industry dawned upon the Californian growers.

In 1883 I became identified with this interest. I had a vineyard planted, and a splendid piece of 'summer fallow" was the result. Next year it was planted again, and after a bit of "experience" I succeeded in producing from 160 acres. At that time, 1886, enough Fresno goods were in the market to call attention to California as a raisin-producing district, and to-day there is enough to command the attention of the commerce of the world.

Raisin vines, of which the Muscat is chief, are grown from cuttings, and when planted in the vineyard at the grower's notion of from 6 x 6 to 12 x 12 feet, and pruned down to a stump about fifteen inches in height the first year, and kept there ever after, will produce in four years, and thereafter the crop increases, both in quantity and quality. I safely say this for the reason that, while there may not be an increase in pounds, there is in older vines to be considered the fact that the skin grows thinner and the seeds smaller.

At four years, in Fresno, you may say that you have a vineyard ready to produce a reasonable crop. How are raisins made?

"Colonel," said a very intelligent business man from the East who visited my vineyard, "how much does your sugar cost you in making raisins?"

I confess that for once in my life I was nonplussed. "Sugar," said I, "what do you mean?" He explained, and I found that he labored under the mistaken idea that raisins were a confection, the same as candied fruits.

I was at the trouble to explain to him that when Byron, enumerating the sweet things of earth, said, "Sweet is the vintage that reels to earth, purple and gushing," he was but forecasting a Fresno raisin vintage; and that all the sugar in raisins was but the natural sugar in the grape, which in first crop ranges from twenty-three to twenty-six per cent. by a saccharometer test of the "must." I found that my statements were not accepted as fact, but fact it is.

How do we make raisins? Let me briefly tell you. The vineyard grown, the crop ripened, the clusters are clipped from the vines, laid upon trays, usually 2 x 3 feet, made of "shakes" split from the pine trees—clapboards they call them East,—and dried in the sun. How long? Ah, there's the rub! The drying is the issue, but we understand it well. It would take pages to describe the minutia. Enough to say that the method is simple, inexpensive, and that the goods are now graded to meet the demands of the market of the world. More: California to-day produces as good a raisin as is made on earth, and for cleanliness nothing in the world compares with it. I say this, challenging its refutation.

"Where can the raisin be grown?" I hesitate not to say that, because of the natural elements of climate, soil, and irrigation systems in vogue, Fresno represents over three fourths of the industry, and its possibilities in the future.

As evidence of this I am permitted to use the statement of the shipments over the Southern Pacific Railroad, which includes only Eastern shipments for 1895 and 1896.

In 1895 the shipments of raisins and dried grapes amounted to 83,924,142 pounds. In 1896 the shipments of raisins amounted to 61,609,040 pounds. This does not include local shipments, but only those to eastern points.

Beginning in 1876, with no shipments, and then taking into consideration what has been accomplished in twenty years, the result challenges belief. We admit it; come and see us, and we will show you the proof.

Much apprehension has been manifested of late that grape seeds taken into the stomach may be the cause of appendicitis. Fresno meets all criticism, and to-day the grape seed is not only eliminated from the human equation of death by extraction in the seeding machines introduced last year, but the housewife is saved a deal of trouble in making puddings; and it is ever safe to say that the American product, handled by American hands, with due regard to American demands for cleanliness, has now placed the cheapest product of food before the people in the best shape and cleanest form.

I have avoided in the foregoing criticism of products. I have avoided all claims for superiority. I simply ask of visitors to the coast that they will visit this great raisin, wine, and fruit-producing center during their stay here, accept our hospitality, courtesies, and entertainment, to the end that they may learn more fully of this great industry, and be assured that my statements are but mildly drawn.

The Fresno district has about 35,000 acres of raisin vineyard, which is at least three fourths of the output of the State. The average yield is about one ton to the acre.

APRIL IN CALIFORNIA.

An April, fairer than the Atlantic June,
Whose calendar of perfect days was kept
By daily blossoming of some new flower.
The fields, whose carpets now were silken white,
Next week were orange-velvet, next sea-blue.
It was as if some central fire of bloom,
From which, in other climes, a random root
Is now and then shot up, here had burst forth
And overflowed the fields and set the land
Aflame with flowers. I watched them, day by day,
How at the dawn they wake, and open wide
Their little petal-windows,—how they turn
Their slender necks to follow round the sun,
And how the passion they express all day,
In burning color, steals forth with the dew,
All night in odor.

—*E. R. Sill.*

TRANSPORTATION IN CALIFORNIA.

By W. G. Curtis.

IT is a popular misconception that transportation in California has been monopolized in the interests of railroad corporations, in a manner detrimental to the interests of the State, and that this supposed monopoly of transportation facilities has prevented the extension of cultivation and has in other ways been harmful. This opinion seems to be most widely and strongly expressed in the larger towns located upon tide water, and may, to some extent, be accounted for from the fact that California has, as compared with other parts of the United States, exceptional facilities for transportation by water; that, to a large extent, its actual necessities for transportation are served by water carriers, and consequently the development of rail transportation, both transcontinental and local, has tended to disturb commercial conditions established with reference to lines of water transport only.

It is proposed in this article to present certain facts tending to show the truth of the matter, and to indicate the circumstances which prevent the monopolization of transportation facilities to such an extent that unjust or extortionate rates can be charged by carriers. In other words, to suggest that any serious investigation into the details of the question will show that, in point of fact, the producers are well and reasonably served by the railways, that extortion in rates is prevented by permanently established competition of carriers by water, upon waterways never obstructed by ice, or (excepting for comparatively short sections on the upper portions of the rivers) interrupted by low water, and that, where the currents of trade have been interrupted, deflected, or reversed by the extension of rail lines, such changes are a necessary and irrevocable result of railroad construction, and cannot be made otherwise by any policy, either hostile or friendly, of the railway owners.

The settlement and development of California by the American people may be said to have commenced in 1849, immediately after the discovery of gold. At that time (although railroad building commenced in 1855) and, practically speaking, for the succeeding twenty years, up to the completion of the pioneer overland railroad in 1869, the transportation interests of the State were served entirely by water carriers.

California, though often called a "one railroad" State, is far from being so. It has twenty-nine operating railroad companies. On June 30, 1896, the aggregate mileage of the lines operated by the Southern Pacific Company was 3101.61 miles; the aggregate mileage of railroads operated independently of, or in competition with, the Southern Pacific Company, was 1959.59 miles. Total railroad mileage in the State, 5061.20 miles.

The mileage of railroads operated in the State, from the commencement of railway construction to date, is indicated in the following table:—

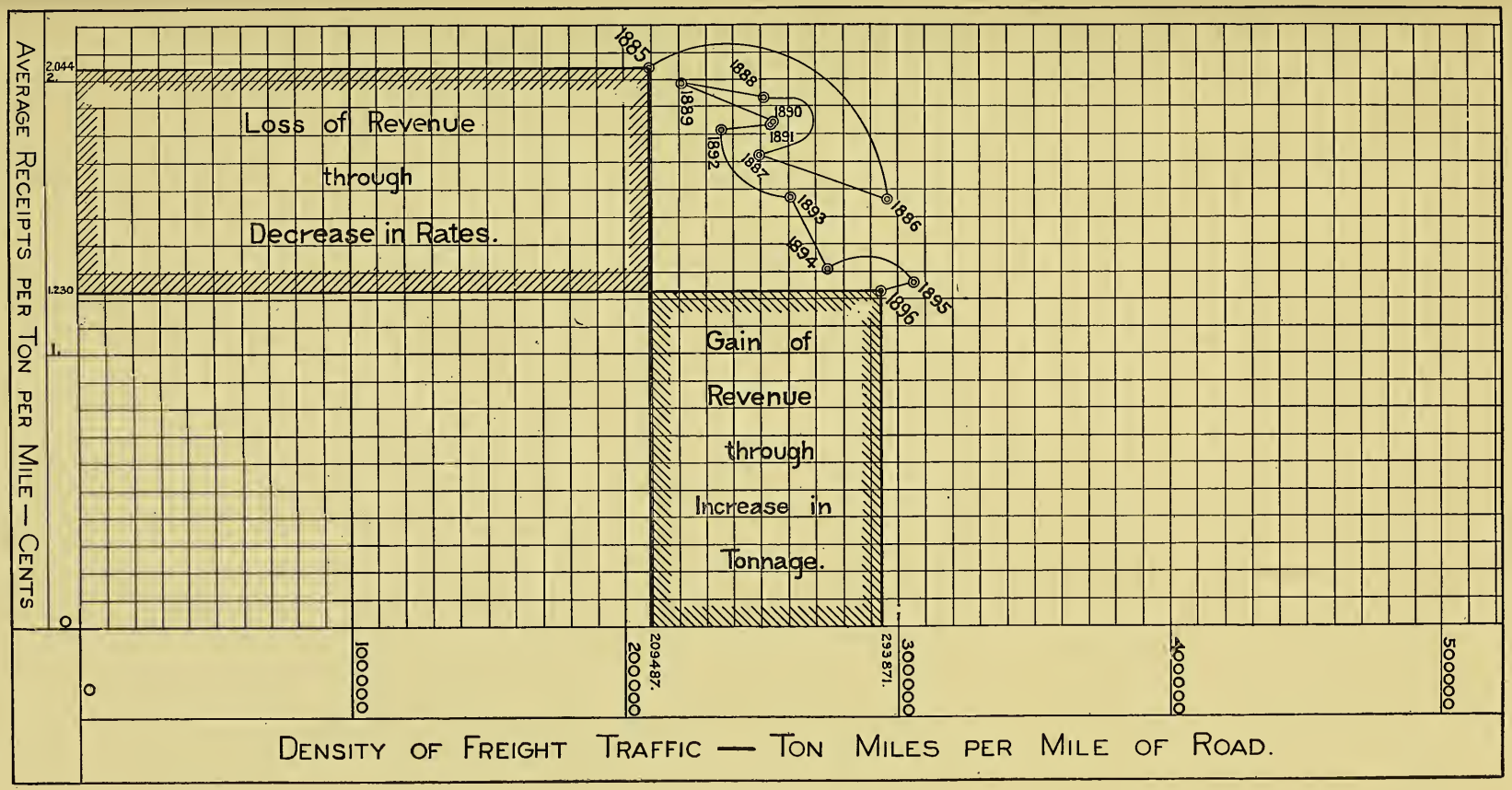
Year.	Miles Operated.	Year.	Miles Operated.
1855	8.00	1880	2,195.00
1860	23.00	1885	3,045.05
1865	214.00	1890	4,328.03
1870	925.00	1895	4,757.55
1875	1,503.00	1896 (June 30th)	5,061.20

Starting from the year 1870, which may be fairly taken as the commencement of the railroad era in California, it is to be noted that the increase in railroad mileage from 1870 to 1880 was 137 per cent., as compared with an increase in the population of 54 per cent. From 1880 to 1890 the increase in railway mileage was 100 per cent., as against an increase in the population of 40 per cent.; and for the two decades, 1870 to 1890, the increase in railroad mileage was 367 per cent., while the increase in population was 116 per cent. It will be noted that the increase in railroad construction has been at a rate considerably greater than the rate of increase in population, and the people of California now have, in addition to their exceptional water transportation facilities, 3.73 miles of railroad to each one thousand inhabitants, as against 2.65 miles of railroad in the remainder of the United States. While this is true, from the view point of the railroad companies, it is, to a large extent, compensated for by the greater productive capacity of the people of California, as compared with the remainder of those in the United States. This proposition may be illustrated by the following table, based upon the United States Census Reports for 1890:—

RAILWAY MILEAGE, LAND AREA, VALUES, AND PRODUCTIONS TO EACH ONE THOUSAND INHABITANTS.

	California.	Remainder of United States.
Miles of railroad	3.73	2.65
Land area—acres	84,000	36,000
Improved land in farms—acres	10,100	5,600
Valuation of all property	$2,097,000	$1,018 000
Valuation of farm products	$72,000	$39,000
Valuation output manufactures	$177,000	$149,000
Valuation imports and exports	$70,000	$25,000
A mineral production of:—		
Gold and silver	$11,580	$1,390
Quicksilver	$990	. . . . .
Asphaltum	$110	$1
Stone (building, etc.)	$1,760	$830
Mineral waters	$210	$20
An agricultural product of:—		
Wheat, bushels	34,000	7,000
Barley, bushels	14,000	1,000
Hay, tons	2,660	840
Beans, bushels	590	40
Hops, pounds	5,420	530
Wine, gallons	12,110	160
Raisins, pounds	22,720	. . . . .
Beet sugar, pounds	29,040	160
Wool, pounds	19,940	2,720
Honey, pounds	3,250	980

As might be expected from this, the number of tons of freight carried by railroads, per mile of line, is slowly increasing. This is illustrated by the accompanying diagram, which shows, for the Southern Pacific lines, Pacific System (of which about three fifths are located within the State of California), an increase in the tons carried one mile, per mile of road, from 209,487 tons in 1895, to 293,871 tons in 1896. This diagram also illustrates the fact that railroad rates have decreased faster than warranted by the increasing tonnage, thus resulting in a loss of revenue. For example, it will be noted from the diagram that in 1885 the average rate per ton per mile was 2.044 cents, and the tons carried one mile per mile of line, 209,487, equal to a gross freight earning per mile of road of $4,282.00; while in 1896, the rate per ton per mile was 1.23 cents, and the tons carried one mile, per mile of road, 293,871, being equivalent to an earning per mile of road of $3,614.00. This loss in revenue is indicated graphically by the diagram.



Southern Pacific Co. — Pacific System —.

Freight Rates and Tonnage Diagram.

Years 1885 to 1896 inclusive.

It follows from these figures that, if the rate of 1885 had applied on the tonnage of 1896, the earnings per mile of road would have been $6,007.00, or 65 per cent. more than was actually earned. To put this another way: the actual earning in 1896 was $2,392.00 per mile of road less than it would have been at the rates of 1885; and this difference of $2,392.00 per mile represents an aggregate reduction in freight charges for 3,101 miles of $7,419,000.00. In other words, the freight earnings of this one system of roads in California for 1896 were $7,419,000.00 less than they would have been had the rates of 1885 applied.

At present the net earnings per mile arising from railroad operation in this State are about ten per cent. less than the average figures for all railroads in the United States; and all things considered, the rates charged by California carriers compare favorably with charges for similar service elsewhere. In this connection it has been estimated by the United States Department of Agriculture that, for the various agricultural products the prices of which are largely dependent upon the cost of transportation to different markets, and which are also, to a greater or less extent, fixed by prices in foreign markets, irrespective of prices and demands local to California, the value upon the farms is greater in California than for the general average of the United States, by the following percentages:

Corn	25 per cent.	Oats	36 per cent
Wheat	16 " "	Barley	2 " "
Rye	20 " "	Hay	11 " "

Facilities for the transportation of persons and property can be conveniently measured as to their adequacy for industrial necessities by instituting comparisons between localities, or between different periods of time in the same locality, material differences in local circumstances and conditions being given fair consideration.

When setting in contrast the transportation conditions in California and in other countries, particularly other portions of the United States, this State's physical geography, also the density and distribution of its population, is essential to a clear comprehension of the matter. The salient facts in this connection are:—

1. The coast line of the State along the Pacific Ocean extends from about 32° 32′ to 42° North Latitude, or almost exactly five eighths of the Pacific Coast line, and equal in extent to very nearly one half of the Atlantic Coast line of the United States. The length of the shore line between the northerly and southerly boundaries is almost exactly one thousand miles. The average width of the State is about two hundred miles. The general trend of the larger valleys is in a northerly and southerly direction, and the easterly portion of the State is mountainous, the highest peaks running from 14,000 to 15,000 feet in altitude.

2. The total area of land surface is 100,207,000 acres, of which 39,500,000 acres or, in round numbers, forty per cent., may be classed as arable. Out of this total of arable land, 25,000,000 acres are estimated to lie within the great central valley basin (San Joaquin and Sacramento Valleys), which is something over four hundred miles in length.

3. Seventy-five per cent. of the arable land and ninety per cent. of the present population are located between the Pacific shore line and a line parallel with and 120 miles east of it. About fifty per cent. of the arable land and about seventy-five per cent. of the present population are located within twenty-five miles of navigable waterways.

4. The mildness of the Pacific Ocean permits the operation of many small ports and open roadsteads along its shores. In fact, excepting in the stormiest portions of the winter months, it is possible for coasting vessels to receive and discharge cargo at almost any point where timber lands and other arable lands abut upon the shore. Coastwise, therefore, the ocean may be regarded as the trunk line for transportation local to California.

On the coast of California, south of San Francisco, there are sixty-four, and north of San Francisco, fifty-six established ports and landings, making a total for the California coast of one hundred and twenty ports, equal, on an average, to one landing for every eight and one third miles of coast line. In addition to this, there are one hundred and thirty-five regular landings upon the bays and rivers.

The fleet of vessels registered with home ports in California, at various periods, are as follows:—

Year.	Number of Vessels.	Gross Tonnage.
1880	884	202,114
1889	957	314.227
1897	1,095	(estimated) 355 500

The miles covered in trips and voyages of these vessels in 1889 was 8,239,608; in 1896 (estimated), 9,400,000.

Of the payments for transportation local to California, about forty-five per cent. of the total is paid to water carriers, and fifty-five per cent. to the railroad companies.

FACILITIES FOR TRANSPORTATION TO AND FROM OTHER STATES AND COUNTRIES.

Here again California's facilities are excellent. Its connections with foreign countries are largely by sea, the entrances and clearances of vessels (both sailing and steam) at the various United States Customs Districts in California, for the year ending June 30, 1896, bound to or from foreign ports, was:—

	Vessels.	Tonnage.
Entered	1,091	1,359,447
Cleared	1,025	1,262,407

In addition to this movement, which is understood to include vessels carrying commodities between the Atlantic and Pacific ports of the United States, via the Isthmus of Panama, clipper ships also ply between such ports via Cape Horn, from two to four departing from each coast monthly.

Overland transportation is offered between California and the eastern portions of the United States via the following transcontinental lines: Canadian Pacific Railway; Northern Pacific Railroad and connections; Great Northern Railway and connections; Union Pacific and connections, via Portland, Oregon; Central Pacific Railroad and connections, via Ogden, Utah; Atlantic and Pacific Railroad and connections, via Albuquerque, N. M., and Southern Pacific and connections, via El Paso. The agencies of these various routes are established in the principal towns, and their representatives, actively seeking patronage all over the State, are equipped to contract for the movement of freight and passengers from points of origin to destination. The people of California thus command the situation. One railroad failing to please, its patrons can give their business to another, and all being unsatisfactory, shippers can any time resume old tactics and ship by sea.

The natural conditions are so much against an obstructive policy on the part of the railroads, that climate, fertility of soil, and other things equal, those counties located in the great central valley of the State, which are practically out of reach of transportation by water, and which for twenty-five years have been served by transportation facilities by one railroad company (the Southern Pacific Company), have in their growth and development not only kept pace, but in all things have progressed faster than the other great valley counties, including those which enjoy, throughout their area, all the advantages conferred by free competition between land and water carriers. In fact, so prosperous have these counties become that San Francisco capitalists have selected this region as the most promising for profitable investments in railway transportation facilities, and are now engaged in building new lines through these counties, to compete with the pioneer railway carriers. The practical effect of the construction of these new lines is to complete the system of competitive carriage, either rail *vs.* rail, or water *vs.* rail, throughout the State; and, to sum up, California has exceptional advantages, both for local transportation and for the interchange of commodities with other States in the Union and with other countries in the world. The competitive conditions limiting the powers of its transportation companies are firmly and permanently established. Its transportation facilities are not only adequate to, but are in advance of, the commercial and industrial necessities of the people.

W. G. Curtis.

Yellow the gold from the mountain mines,
Golden the evening west,
But the golden flower that far outshines,
The Spring wears on her breast.

THE CANNED FRUIT INDUSTRY.

By J. H. Flickinger.

THERE is no reason why the canned fruits of California should not take precedence of all others preserved by this process, and command, as the standard of superiority, the best markets of the world. My own experience demonstrates this possibility. It is an assertion capable of statistical proof that California contains more acres especially adapted to the production of citrus and deciduous fruits than the whole of Europe, and the results of cultivation have shown conclusively that Californian fruits of these varieties are in every way superior to those grown in the South of France, Portugal, Sicily, and along the Mediterranean.

Judicious pruning is an important factor in the production of fruit of a quality specially fitted for canning purposes. It is necessary to cut off at least nine tenths of the fruit-bearing wood, and to thin the blossoms materially. In California this pruning process progresses from November 1st to about March 1st. The first fruit thinned for canning purposes is the apricot, beginning about May 1st. On a limb four feet long, with three or five lateral branches, there is ordinarily, under conditions of unrestricted growth, between 100 and 150 apricots. When properly thinned and cut back, that limb will produce not more than twenty apricots, but these are perfect in quality, superior in size, and are classed as "extras." This product results in the finest canned fruit in the world.

Apricots thus treated measure not less than two and a half inches in diameter. The ordinary fruit of this class measures only one and a half inches.

The season for thinning the peach follows that of the apricot, beginning about May 10th and continuing until the 15th or 20th. Peaches are thinned as closely as the apricot, or perhaps more closely, as this fruit requires extraordinary attention to insure uniform growth, from a minimum diameter of three inches to any size compatible with the strength and vitality of the tree. The season for picking the apricot begins on the 20th of June, and the first peaches are picked on July 15th. From that date until October 1st the different varieties of peaches are received at the canneries.

The cherry is the first fruit to ripen in this State. The season begins on May 1st, but there are exceptional instances of earlier production, as at Vacaville, where cherry picking begins two weeks before the date mentioned. This fruit requires the mildest and the most uniform climate of all the deciduous products of California. It grows best in an alluvial soil thoroughly cultivated, and the fruit must be subjected at no period to a climate warmer than ninety degrees. In consequence the cherry crop is confined to a few favored localities, generally near the bay region; the fruit does not thrive in the interior of the State where the summer heat exceeds 100 degrees.

After the cherry crop has been gathered, it is absolutely necessary to irrigate the trees moderately to replenish the exhausted moisture and prevent the tops from perishing.

The soil of orchards producing fruit for canneries should be cultivated to a depth of not less than six to eight inches, and this cultivation should be repeated six or eight times during the season. The surface of the soil should be alluvial in character, and capable of holding moisture by capillary attraction, thus blanketing the roots of the trees and maintaining an equable temperature.

All orchards bearing extra fancy fruits for canning purposes should be irrigated or even flooded during the months of December, January, and February, but not later than March. It is a safe rule to put on not less than twenty inches of water for fruit of this class. This moisture, added to the rainfall, will penetrate good alluvial orchard soil to a depth of eight or ten feet. This irrigation cannot be applied effectively to adobe soil or lands that are crusted with hardpan to a depth of three or five feet. The alluvium must be at least fifteen feet, and may reach to forty feet. I have frequently found roots of trees in these alluvial deposits at a depth from fifteen to twenty feet. And the best experience shows that this mode of cultivation will not succeed with shallow and poor lands.

The best fruits for canning are cherries (black and white), apricots, peaches, pears, and plums. The best apricot is the large, delicious Moorpark, which cannot be excelled

anywhere in the world for flavor and size. The Hemskirk is one of the most prolific bearers in California, and for canning purposes is second only to the Moorpark. There are other varieties, but they must all be graded inferior to those mentioned.

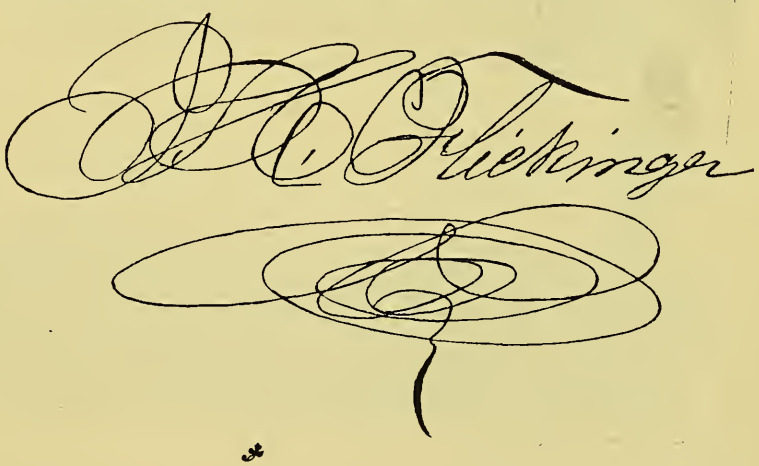
Of the peaches, the first as regards canning quality is the Crawford (a freestone); the lemon cling is also, *par excellence*, the canning peach of California; and the California cling, the Nichols cling, the orange cling, and other varieties of the cling are suitable for canning. Of the late peaches (September 25th to October 10th), the Salway and the Henrietta cling, if permitted to ripen fully in a climate not excessive, make a high-flavored product.

The Bartlett pear is the only fruit of this variety that produces an extra fine quality of canned goods, and all other varieties have been displaced for this superb fruit.

The egg plum properly canned and processed makes the most delicious product of the Californian orchard. Other varieties that are preferred for canning are the Jeffersonian gage and the green gage.

All fruit, to make extra superior table fruit, must be picked full-flavored, as it would be eaten out of hand. It must not be transported too far, and it must be processed immediately to retain its flavor and aroma. Fruit shipped ten to fifty or 100 miles, especially peaches and apricots, must be picked green, and in this condition it cannot be converted into first-class goods. Canneries should be adjacent to the orchards, so that the fruit can be picked, delivered, and processed on the same day. This is the only method by which fancy extra table fruit can be produced. It would be to the general interest of Californian packers if they would pack their goods for delivery in good condition, as required by the canner. If more attention to this detail were exercised, the consumption of extra fine canned goods would more than double in every market of the country in the near future, and the profit to all concerned would be correspondingly greater and more certain. The consumer who has once tasted fruit of the best quality, never returns to the green-packed fruits ordinarily produced by the canneries.

I am convinced that the best results will be ultimately attained in this industry on this coast, and that the fame and quality of Californian canned fruits will be enhanced as we come to understand and take advantage of the natural conditions that have contributed to make California the best fruit-raising region on the face of the earth.

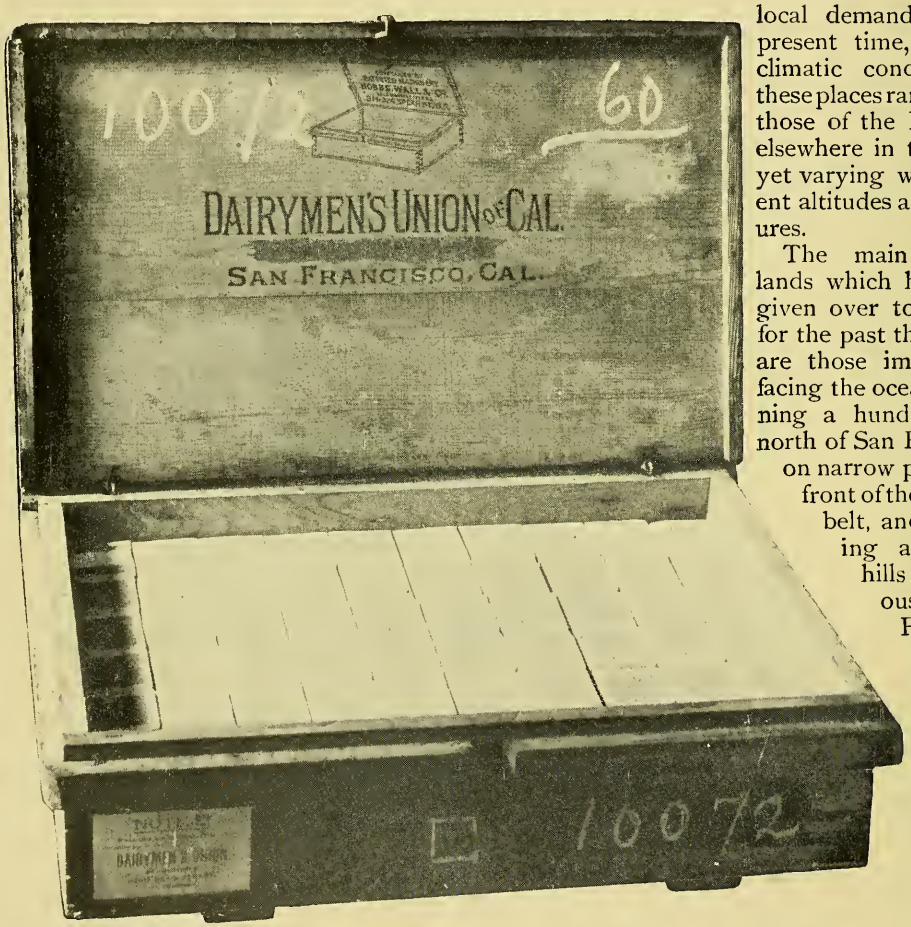


In Alpine valleys, they who watch for dawn
Look never to the east; but fix their eyes
On loftier mountain-peaks of snow, which rise
To west or south. —*Helen Hunt Jackson.*

CALIFORNIA DAIRYING.

By Saml. E. Watson.

IT is difficult to make a concrete statement which will give any comprehensive idea of dairying in particular localities of the State. The industry began in the mountain valleys adjacent to the mining regions, and the American cows tied behind the wagons of the gold-seekers in 1849 and succeeding years were the foundation for our present dairy stock. The mountainous and isolated valleys of the Sierra constitute an important division of dairying for local demands at the present time, and the climatic conditions in these places range nearer those of the East than elsewhere in the State, yet varying with different altitudes and exposures.



The main grazing lands which have been given over to dairying for the past thirty years are those immediately facing the ocean, beginning a hundred miles north of San Francisco, on narrow plateaus in front of the redwood belt, and extending along the hills contiguous to San Francisco Bay and south to Pt. Conception, comprising a district of coast line 400 miles in length. The climate of this region is peculiarly favorable for dairying, and the temperature seldom runs below forty degrees in winter or above eighty in the summer season, and with the first rains in October grass and herbage spring up and continue luxuriantly until grazed down and the June sun cures the feed upon the ground, after which the best that yet remains is relied upon to carry the stock through, with supplementary foods, until the fall rains again cover these hills with green. The prevalent summer fogs aid in extending the grass season after the winter rains are over, and a considerable amount of barley, wheat, and oats are grown and cut for hay. This is fed during the fall months, and in some instances dairymen who have proper regard for their herds feed bran and roots also. A large

number of foreign owners of dairy cattle allow their animals to become emaciated and unfit for profitable service when the rains are delayed, rather than buy food to carry them through. The great need of the State is for a class of Eastern dairymen, who have been accustomed to feeding upon a rational basis, and are responsive to modern teaching of right methods.

These hill districts were very profitable to the men that own immense tracts and lease in subdivisions for the long period preceding the nineties, but the great increase in outside production of dairy products in recent years has brought values so low that it has been found difficult to compete, and rents and values of these lands have decreased immensely. The long and close cropping of them has also resulted in a depreciation of their real grazing qualities, and the better native herbage has given place largely to growths which the cattle do not touch. These unfavorable species are thus allowed to reproduce in an increasing ratio, while those which are desirable do not have the chance to mature and re-seed. The land is adapted only to grazing, and the problem which presents itself is that of allowing it to recruit itself. Possibly this may be done by the substitution of sheep, to eat away all the growth equally, and also by the improvement in the cattle. At present it takes about seven acres to sustain a cow, which produces but 150 pounds of butter annually. If the producing value of every cow is doubled and the number halved, and an intelligent system of feeding condensed foods and millstuffs be adopted, this land will again become profitable.

Contrasted with these hill dairy regions is one of very limited extent, that for ideal dairy conditions probably exceeds any territory of the same size in the world. This is in the river valleys of Humboldt County and in similar valleys of the upper coast. The most notable of these is the Eel River Valley, where upwards of 12,000 cows are kept upon less than 20,000 acres, on a compact body of sedimentary land near the mouth of this large stream. On either hand the hills are densely covered with redwoods, which supply cheap fencing, barns, and fuel for the creameries of the valley, which make all the milk product up into butter for the San Francisco market. The season is later than in the southern counties, and this butter comes into the market in June, when that from the lower country begins to decrease. It usually causes a very low price for the product of the coast, which is taken advantage of for packing purposes. After this demand is satisfied prices again recover, and the later Humboldt product brings fair prices.

Secondary to the Eel River district is the region bordering Humboldt Bay. The largest body of land is known as the Arcata bottoms, and this is constantly increased by reclamation of tide lands from the bay. In these communities there is a preponderance of Americans and Scandinavians, and for the Eastern dairyman, desiring to locate among a class of people to which he has been accustomed, this is undoubtedly the country which would satisfy him. The methods of dairying are almost the same as in the Eastern States, and it is almost the only district where red and white clovers, timothy, rye grass, etc., are specially cultivated for dairy feed. The rainfall is equal to that of the States of the Mississippi Valley, and almost every characteristic of Eastern life is reproduced here. The main difference is that of climate, and the prevailing aspect of this northern coast county is that of perpetual green, though snow is frequent upon the higher ranges of hills and mountains. There is a cordiality among the people of Humboldt which is very inviting to the stranger accustomed to the indifference of less isolated places.

A development of unknown proportions is taking place in the dairy industry of the State, and while there are some great obstacles to contend with, more especially climatic, this development may be of the greatest importance in increasing the milk production and fixing values. If alfalfa will reduce the cost of producing milk materially, and thereby force our hill dairymen into better methods, such as I have spoken of, a great impetus will be given the industry in the State, for a good export trade in evaporated milk, cheese, and butter would be insured in direct competition with regions where the climate is less favorable for a long season. Alfalfa requires a warm climate and irrigation for a large yield, and in the Los Angeles region the conditions are ideal. Dairying there has assumed great prominence in many of the lowland districts bordering on the ocean and in interior valleys with an abundant water supply.

The great Sacramento Valley, paralleling the old coast hill dairies the entire 400 miles, and divided from it by the Coast Range, is rapidly being turned into an alfalfa district, and

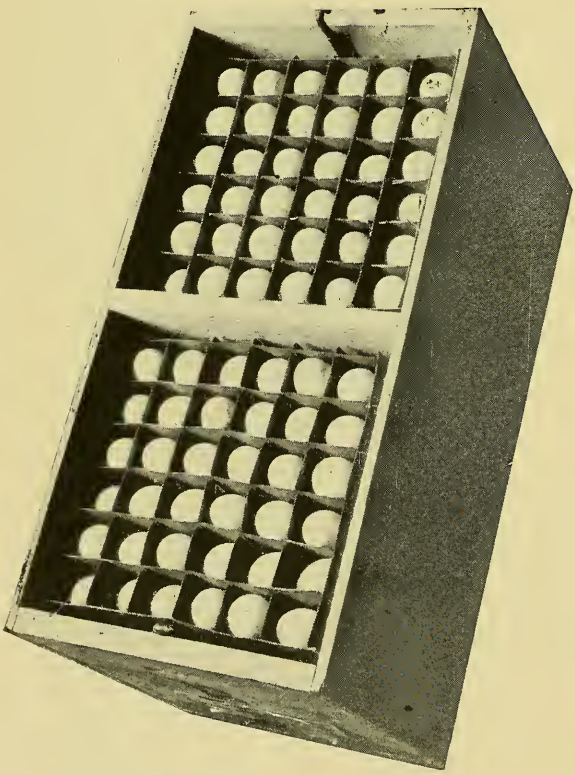
stocked with cows for its conversion into milk. The difficulties that the creameries of the valley have to contend with are the excessive heat and unfavorable shipping facilities, but the use of refrigerating machines is growing, and the local demand in several of the larger towns and in the mining territory is equalizing the conditions, so that no serious obstacle to this great development is likely to be met.

California has an advantage in its long seasons for grazing and growth of feed-stuffs, and consequent cheaper production of milk, over Eastern dairy districts. Its situation is favorable for any possible export trade, and with improvement of methods throughout its 300 creameries and nearly 200 cheese factories, the industry will be one of very great importance.

Saml E Watson,

POULTRY FARMING.

By J. A. Finch.



THE buisness of raising chickens and eggs has been considered hitherto of small importance by the Californian farmer. In consequence the people of this State have been compelled to import over $2,500,000 worth of this product annually from the Eastern States. Regarded in view of the fact that the climate of California is especially adapted to successful prosecution of this industry, it would seem that the Californian farmer has not yet learned the lesson of the hard times. He has not yet grasped the fact, palpable enough to the consumer compelled to economize even his food supply, that the surest profits in this period of financial stringency emanate from those industries that cater to the cheap necessities of the people.

Within a radius of seventy-five miles of San Francisco are many locations admirably adapted to the raising of poultry. It would entail but little difficulty to find suitable tracts of from five to fifteen acres in the foothills, warmly sheltered, with ample supply of running water, near lines of railroad, within easy reach of the best market in the State. Profitable returns from this market are assured to any industrious, intelligent poultry raiser by the circumstance that he has a margin of over $2.000,000 of imported product to meet before he begins to fear an excess of supply. Moreover, it is a business that is virtually free from competition. The egg trust is not yet hatched, and the hen syndicate is not even incubating.

The farmer of California might get a hint of his own possible advantage in the premises by studying the methods of those who are supplying this State with eggs and

poultry from the Eastern States. Informed of the profitable results to the poultry farmers of the East, the Californian might be encouraged to try the experiment on his own acres. Last year the egg and poultry production of the United States reached the enormous amount of $500,000,000. This was greater than the return from cotton, wheat, and cattle, and in spite of the vast production, this country imported during 1896, from Canada, Norway, Sweden, Belgium, and other foreign lands, more than 60,000,000 dozen eggs. In the States of Kansas, Iowa, and Nebraska, during the past three years, the poultry has furnished the farmer with the necessaries of life. It is estimated that corn costing twelve cents a bushel will feed and mature a hen which, when sold, will average thirty cents, or at the rate of thirty cents a bushel for the corn, to say nothing of the income from the sale of the eggs.

The last census shows that in Ohio there were 13,000,000 fowls, 500,000 turkeys, 270,000 geese, and 409,000 ducks. In Missouri there were 22,000,000 fowls, 1,000,000 turkeys, 849,000 geese, and 627,000 ducks. It is conceded by poultry raisers that a fowl will pay seventy-five cents net profit annually. The immense profits of the business in Ohio and Missouri may be easily computed, and there is no reason why the same results may not be attained to the extent of the local market in this State.

In the New England States large capital is invested in the business of poultry raising. The most improved methods are employed, and some of the plants represent investments of from $5000 to $100,000. It must be remembered in this connection that this business is successfully conducted in a section of the country where, during six months of the year, the climate is rigorously adverse to this production. In California the climate throughout the year is not only favorable to profitable production, but it is also conducive to the best results attainable in any country in the world. All that is required additional is ordinary judgment, close attention, and a determination to succeed.

FLORA OF CALIFORNIA.

By Emory E. Smith.

"Consider the lilies of the field, how they grow; they toil not, neither do they spin: and yet I say unto you, that even Solomon in all his glory was not arrayed like one of these."

IN exploring the flora of the Pacific Slope, both natural and acclimated, one enters a field of unchallenged delight—a veritable wonderland, where nature scorns brevity or restriction. From the fir-clad peaks of the Sierra to Palm Valley in the South, the shifting sea sands at the West and the somber forests of the North, Flora is regnant, the year round, changing her court from mountain to plain, and her vestments from brown to green and gold and blue, at the season's behest.

So vast is California and so diversified in contour, that the investigator finds, in truth, a never-ending springtime and a congenial place for nearly every plant and tree that grows upon the earth.

While the great mountains, with their storm-swept crests, are wrapt in silent whiteness, the warm rains are clothing the hills and valleys of the southern counties with green and gold, vivifying all nature. Quickly the green mantle spreads northward; then up the mountain sides this glorious spring chases the melting snows, leaving a trail of beauty in its wake. While far down in the valleys the harvest has been gathered and the hills have

been browned by midsummer heat, we pluck spring's daintiest floral offerings from the shadow of the snow banks upon Mt. Shasta's brow.

California's flora can only be summarized in so brief a space as this, but a glimpse here and there of its beauties may inspire the reader to observe more closely the wonderful possibilities of nature in this favored country.

Beginning with the alkali plains which seem so dreary and desolate to the casual traveler, the plant lover finds much of interest. There are the giant cacti, lifting their straight, stiff bodies high into the air, crowned in season with snowy flowers; thousands of acres of opuntias, their thick, prickly leaves studded with gaudy yellow and purple blossoms; stately *Yucca brevifolia*, with curious, tufted branches, and the more humble but still beautiful *Yucca Whipplei*, with the great spikes of creamy flowers. For a few brief days, when the ground is moist, these desert wastes are bright with annuals, which ripen and sow their seeds and disappear as completely as if they had never existed. Even a chaste, white lily rises from the bare sand, as if to show that nature's precious gifts are not all bestowed upon the goodly lands.

On the sand dunes by the sea we find a rich flora battling for a foothold in the uncertain earth. Great, white and yellow lupins, dainty blue iris, sea pinks, strawberries, brodiæas, sand apples, echeverias, asters, alliums, and a host of other plants and shrubs carpet the sand hills, making common cause with the willows and scrub oaks.

At Monterey the pine forest sweeps down to the water's edge, but for the most part the immediate coast line is quite devoid of forest.

In the low coast mountains the flora is rich beyond brief mention. This is the home of the majestic redwood, beneath whose lofty, somber branches in the subdued light grow the trilliums, yellow iris, oxalis, white violets, and thrifty ferns. The live oaks are luxuriant, and the great, gaunt madroños lift their glossy heads. Manzanitas, with their smooth but knotted and twisted stems, and exquisite flowers, choke the forest spaces; lilacs (*Ceanothus*) in lavender, white, and blue, lend softness to the greenery. Christmas berries (*Heteromobs arbutifolia*) give gaiety in the winter, and honeysuckles, clematis, wild peas, and roses fight for position and light.

In localities great clumps of tawny-blossomed azaleas lend their charm. Calycanthus, dogwoods, wild plums, maples, and buckeyes are scattered along the streams.

Beneath the shrubs, and in open spots, larkspurs, blue and white lupins, star tulips (*Calochortus*), brodiæas, gold-back ferns, yerba buena, strawberries, gooseberries, thimbleberries, orchids (*Cypripedium Montanum*), columbines, and hundreds of less familiar flowers find shelter.

In the shady cañons, in safe retreat, are nestled shade and water-loving plants. Mosses and maiden-hair ferns cling to every projection; lilies and broad-leaved plants bathe their roots in the water, while giant ferns, five or six feet high, lend dignity and elegance.

Out in the rich valleys and upon the sloping hills nature has made her great color show. Here is the home of the famous California poppy (*Eschscholtzia*). The eye can drink from these myriad yellow cups a brilliant beauty peculiar to this State. Thousands, yes, tens of thousands of acres of golden glory enrobe the State in early spring, a few blossoms lingering like flickering candles till the season comes again.

In certain sections baby-blue-eyes (*Nemophilas*) claim the ground; in others, yellow violets, godetias, or sunflowers have won the battle. Summer ushers in the lupins, with stately spikes of yellow, blue, white, or purple blossoms, and from the mountain tops to the sea they claim every congenial nook.

In the southern counties there are the scarlet larkspur, six feet high, and the magnificent *Romneya Coulteri* with glaucus leaves and great crepy white flowers, the gorgeous "glory pea" (*Lathyrus splendens*), and many less showy plants.

In the foothills of the Sierra many interesting trees and plants are found. As one climbs higher, columbines, saxifragas, frittilarias, iris, and calochortus, grow profusely. Red and white lilies lift their chaste blossoms above the banks of the streams, and goldenrods light up the rocky niches or cluster about dripping springs. Wild lilacs, azaleas, and dogwoods are met with more frequently. Moss-cupped oaks and some firs of exceeding beauty become plentiful. Wild cherries, plums, chinquapins, gooseberries, etc., grow in thickets. Pitcher plants are tucked away in cool bogs and little lakes and pools are fringed with glowing colors.

Now the sugar pines, ten feet in diameter, and the great *Sequoia giganteas* lift their plumed heads hundreds of feet toward the sky, mute sentinels of the forests, the mightiest of living trees. Nations have arisen and fallen, but they live on, apparently regardless of the lapse of time, save in the occasional dropping of a storm-tossed or lightning-smitten branch. On up the peaks to the verge of eternal snow flora has carried her gifts, and the sparkling crimson snow flower (*Sarcodies sanguinea*), pushes up its beautiful crystalline form from the frozen ground as the snow recedes in summer.

California's adopted flora is almost as bewildering in its profusion as that which nature had given her. I have in mind a private garden which has within its restricted space 3000 kinds of trees and plants, all growing thriftily.

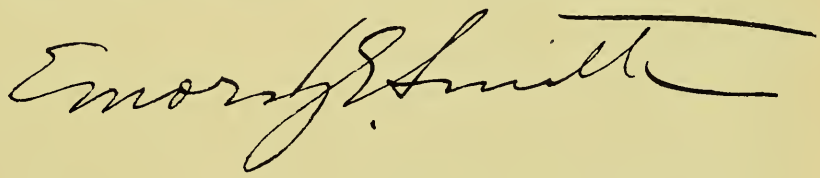
Nearly all of the Eastern and foreign shade and ornamental trees are found in plenty, some sorts, like the *Eucalyptus globulus*, or blue gum of Australia, being conspicuous objects throughout the State. Old-fashioned shrubs, such as lilacs, mock-orange, spirea, snowball, sweet shrub, etc., are perfectly at home, and pæonies, chrysanthemums, foxgloves, zinnias, marigolds, dahlias, narcissus, and verbenas are as common as in Eastern gardens. Indeed they are sometimes so improved by the climate and soil that old friends scarcely recognize them.

Roses are the pride of Californian gardens, scrambling over fences and cottages, crowding each other for room, and sometimes climbing fifty feet to the tops of trees, they are, when at their best in spring and fall, worth a journey across the continent to see.

San Francisco has been called the "Fuchsia City" on account of the luxuriant growth attained there by this graceful flower. The humblest porches and windows are draped with the coral bells. The fuchsia and its companions, heliotrope, nasturtiums, and marguerites, find a place in nearly every yard. Dræcenas and palms are frequent in San Francisco, as they are indeed in nearly all of California. Tree ferns are also occasionally seen. Street trees are not generally planted in the city, the climate being equable and cool, and the sunshine being preferable to the shade. Nearly every city, town, and village in the State to unaccustomed eyes seems a veritable flower garden.

Palms, agaves, yuccas, bamboos, and acacias grow luxuriantly nearly everywhere. Geraniums and pelargoniums run riot, pelargoniums at Santa Cruz reaching a height of six or seven feet, and rose geraniums are frequently met with more than eight feet in diameter. Bananas are grown only for ornament, the climate being too dry and the nights too cool to successfully produce fruit in quantity. Violets are grown by the acre in the neighborhood of San Francisco and Menlo Park, and carnations are grown as a field crop in the neighborhood of Los Angeles, the flowers being cut by the million. Sweet peas are produced by hundreds of acres in the Santa Clara Valley, and the seed shipped to all parts of the world.

Lawns are somewhat more difficult to manage in California than in the East, but with a little care a green sod can be had the year round. California has naturally but few trees or shrubs which furnish richly tinted leaves in autumn, but the sugar maple, the sweet and sour gums, the sumac, etc., which make brilliant the Eastern landscape in the fall season, thrive without special care in nearly all parts of the State, when planted, and the coloring of their foliage is even more brilliant here than in their native habitat.



"Rather this wayside flower!
To live its happy hour
Of balmy air, of sunshine, and of dew.
A sinless face held upward to the blue."

—*Ina D. Coolbrith.*

THE LIVE STOCK INTERESTS OF CALIFORNIA.

By Chas. M. Chase.

A MORE favored spot does not exist upon our great map of States for the breeding and rearing of all classes of stock than that portion of our continent extending northwest and southeast, from latitude 32° 50′ to 42° north, on its western slope, and designated on the map as California.

California is a State of variety in both climate and products, hence a prolific spot for the breeding of all kinds of live stock. Such natural advantages exist for cattle raising on account of her mountainous and rolling lands, unfitted for other purposes, and which by reason of snow in winter, and their precipitous nature, renders thousands of acres unprofitable for cultivation.

These elevations are covered with rich and succulent grasses, wild oats, clover, alfilaria, etc., which are fattening in their green state. Vast fields of wild oats, cured standing by the warm, dry air of summer, form excellent fall pasturage, and seeding themselves, are reproduced annually by copious rains during the winter and spring months. Eight tenths of all cattle slaughtered are from the range, grass-fed, and will bear favorable comparison with the stall-fed cattle of the Eastern States.

The basis of our horned stock were the original herds of the old Catholic Missions and the immense bands of long-horned (so-called) Spanish cattle owned by wealthy *rancheros*. Upon the advent of Americans the condition of things changed. Well-bred Durham and Devon bulls were imported, the mean, cross-tempered little Spanish *toros* were killed, and a determined effort made to "breed up," with the most happy results. The State now abounds with handsome, sleek, well-fed animals, deep red in color, with short horns, well-formed, heavy carcasses, most desirable either for stock cattle or the shambles. These are denominated American cattle, and are the result chiefly of the continued crossing of well-bred Durham and Devon (principally the former) bulls upon the native Spanish cattle.

The Durhams are the distinctive beef cattle of the State. They are a combination of the principal desirable qualities—milk, butter, and beef. Some difficulty has been experienced with thoroughbreds imported, on account of their delicate nature and seeming inability to earn their living, but it has been demonstrated that the offspring of these very thoroughbreds, when born upon the range and indigenous to the climate and locality, have proved themselves "rustlers," equal to the best descendants of the native breed.

The bulk of the beef cattle of the State may be said to be of the short-horn variety. About twenty years ago several small herds of Devon cattle were imported from the Western States, and an effort made to cross them with the graded Durhams, it being claimed that the Devon, being a mountain cattle, were especially adapted to such a rough country as is found on some of the cattle ranges of California. The experiment failed to change the settled convictions of stockmen, and was abandoned.

The Hereford, or "bush" cattle of Australia, were the next breed of beef cattle imported with experimental ideas in crossing. These animals were warmly pressed upon the attention of Californian stock raisers as being "hustlers" of the highest type. Their appearance indicated great quality, and warranted their consideration by many of our heaviest stock raisers, who have since become convinced of their excellence. The result is, we have several distinct herds in this and adjoining States that are kept up, and demand for the young stock each season exceeds the supply.

Messrs. Heilbron Bros., in Tulare County, John F. Boyd, Contra Costa, Don Ray, Sacramento, and Rancho del Paso Land Company, Sacramento, are the principal breeders of this stock in California. Mr. John Sparks, of Reno, Nevada, has an exceptional fine herd of Herefords. Some of his prize herd were successful prize winners at the World's Fair in 1893.

The Holstein-Friesan cattle are a more recent fashionable breed that has attracted much attention in this State during recent years by their milking qualities. They are of excellent size, great docility, and yield a prodigious quantity of milk that is noted for

GRAZING HERD IN DECEMBER ON A FOOTHILL PASTURE, CONTRA COSTA COUNTY.

its cheese-making qualities. They also have some quality for beef, but are used almost exclusively for their milk production.

The Polled-Angus, or Galloway, is another imported breed that has many advocates for their beef qualities. They are peculiarly adapted to a rugged country, and do well in the highest ranges. We have one or two herds of Ayrshires that show most excellent milking qualities, but for beef-producing the standard breed is the Durham, or short-horn cattle, as they seem to cross and carry their quality better than other classes.

For dairy purposes the Jersey cattle have undoubted preference. Under this head are classed Alderneys. A few of the other island cattle—Guernseys—have been imported, but they cut no figure. The Jerseys are without doubt the chief dairy cattle of the State; that is, as the foundation. From them, in conjunction with well-bred Durham cows. are produced a race of dairy animals that cannot be excelled.

HORSES.

Horses have been a prominent factor in California, and the various breeds extensive. In its primitive days the same state of affairs existed as with cattle. The native animal was the well-known "mustang," a wiry creature, scarce fifteen hands, full of fire, and of wonderful endurance. Its origin is in doubt. The best theory is, that it is the descendant of the Spanish horse originally introduced into Mexico during the time of the Montezumas. As a *vaquero* or cattle horse, he has no equal. Of great intelligence, supple as a cat, and with the tenacity of a bulldog, he ably seconds the efforts of the rider, and never fails to run down the fiercest bullock of the band. At *rodeo* he is omnipresent; flying hither and thither, now in full career after a maddened steer, anon like a statue, his mouth, sensitive to the slightest touch, having given the warning that the *lasso* has been thrown and he is to perform his part, that of holding the *lariat* taut until the infuriated animal can be properly secured.

Americans were prompt to see the value of this useful animal, and their efforts have been directed to increasing the size without destroying the peculiar characteristics of the breed. This has been accomplished by coupling the thoroughbred with approved mustang mares, producing a race of animals unequaled in the world for the purpose for which they are intended. Another use for them has been the selecting those with trotting gait and breaking them to harness for stage purposes. With six, and even four of these animals and convenient relays, most wonderful feats of staging were performed in the early days of this State.

The usefulness of the California mustang is universally recognized. But the rapid settlement of this State required other breeds of the horse. Its pastoral nature to a great extent disappeared, and the wants of agriculture and commerce, as well as the requirements of a higher type of civilization, demanded the most improved strains and those best adapted for these various purposes. All sections of the world were drawn upon. The Clydesdale, Percheron, Norman, English Shire, and other breeds of draught animals were largely imported and judiciously crossed, in most instances with beneficial results.

Extensive importations were made of the American trotting horse, a distinctive breed of animals, exclusively intended for road purposes and light harness service. Expenditures extending into the millions have been made in the endeavor to improve and perfect this wonderful breed, with entire success. The *desideratum* of the American trotting horse is, speed combined with pure gait, fine form, and perfect action. California has the proud honor of leading in this important class, its young horses holding the first rank in these essential particulars. The climate of California seems so peculiarly favorable to the breeding and development of the equine race that it has been not inappropriately named the "home of the horse."

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 period of time for the fastest one, two, three, four, and five-year-old trotters, as well as the stallion trotting record of the world. As a matter of history, and as an introduction for the year 1892, a California three-year-old (Arion) sold for the highest figure ($125,000) ever paid up to that time, and only equaled since, for an animal of any age, size, or breed in these United States, and that animal held for the year previous the world's record (2:10¾) as a two-year-old, and subsequently obtained a mark of 2:07¾.

Nor is this all. To the great stables of the East went Arion—as did Sultan, Alcazar, Mascot, Anteeo, Antevolo, Bell Boy, St. Bel, Ansel, and Woodnut, at an average price of $40,000 each. What other State can boast of having produced within its confines and sold such an array of stallions as above presented?

We still have the blood of that noble lot in the veins of their descendants, and when conditions of trade again return to normal, the breeding interest will again assert itself in the avenues of trade. It is but a few years since that our aggregate sales of trotting-bred stock in the New York market amounted to $500,000, and home sales $300,000 more, while the sales of thoroughbreds from one breeding farm amounted to $120,000 annually, aggregating nearly $1,000,000, showing the horse interest to have been of some inportance to this State.

The United States Government has in the past been a heavy purchaser of California-bred horses of from 1000 to 1200 pounds weight, of uniform quality. But prices have been so low that the breeder of these classes could not meet the competition hereinbefore mentioned, and as a consequence either reduced or ceased breeding.

From statistics gathered by the State Agricultural Society, there is shown to be a ten per cent. reduction in the number of horses in this State as compared with the returns of one year ago, while there is a perceptible increase in values. The average shows as follows: Under one year old, $9 per head; under two years and over one year, $15; under three years and over two years, $25; and over three years old, $35, as against $7, $10, $14, and $25, respectively, during the year 1895.

I am of the opinion that a more opportune time to commence the systematic breeding of horses never existed; not, however, on the haphazard idea that anything, so long as it is a horse, will do, but by the selection of blood lines that will give uniform merit. The farming community of this State can profit by taking advantage of the present conditions, and prepare for recovery of values that, in my belief, will come, and be national in character.

SHEEP AND WOOL.

During the reign of extensive cattle and sheep-raising in California, owners were, metaphorically speaking, knighted as barons who counted their flocks by the tens of thousands; ranges extended over a vast territory of unclaimed government land, and with most favorable climatic conditions, California was looked upon as the ideal spot for the production of these great essentials, beef and wool. For a time no other industry was thought of. Peace and plenty prevailed, and this State was regarded as the Mecca for mankind.

Vast flocks of sheep, in bands of from two to three thousand, roamed the ranges in the counties of Los Angeles, Santa Barbara, San Luis Obispo, Kern, Tulare, Fresno, Merced, San Joaquin, Colusa, Yuba, Sutter, Butte, Tehama; in fact, in nearly every county of the State where bunch grass and alfilaria grew in abundance. Sheep multiplied with marvelous rapidity until 1876, when they numbered nearly 7,000,000 on the various ranges, and which year yielded us a wool clip of 56,550,970 pounds, at a price in San Francisco of an average of fifteen cents per pound in the grease, aggregating over $10,000,000 in value.

From that year, which proved to be the zenith of the sheep industry, other agricultural pursuits grew more profitable. With the falling of prices, owners gradually disposed of their flocks and sought other avenues for investment, until to-day, with a change in tariff laws, this great industry has declined to such extent that we have only about 2,500,000 sheep in the entire State, with a wool product of 27,195,550 pounds, with nominal value. The low tariff now existing on foreign stocks is not conducive to any extension of this industry at this time, although there are now many acres of land that could be better utilized for sheep raising than in the growing of any other product, should prices warrant the extension of this interest.

California is essentially a sheep country. Its wild, rugged nature renders a large portion of it worthless for cultivation. Not only this, but its precipitous cañons and gulches, and sparse vegetation upon mountain sides, renders such land valueless as cattle pasture. Upon such ground sheep may be profitably kept, but only certain descriptions—the Merinos. Properly speaking, it should be said the Spanish Merino. This animal seems created for California; good for wool, good for mutton, a fine herder, it has all the qualities to commend it. The French Merino partakes of these good qualities to a limited extent, and a cross of the two has proved successful; but the distinctive breed of sheep

good for all purposes—like the Durham, or short-horn cattle—is the Spanish Merino. Small bands of Cotswold, Southdown, Leicestershire, and Shropshire have been imported, but not extensively. Sheep bred exclusively for mutton, or, to speak generally, "short-wool sheep," will be in but little favor until the State becomes more densely settled, and farmers find it to their advantage to keep a few head upon their meadows and in close proximity to their barns.

SWINE.

The raising of swine in California, up to within a few years past, was a most profitable business, enormous quantities of pork being consumed by the Chinese, and the demand for cured meats makes them a most merchantable article of trade.

Bacon is a staple diet throughout the length and breadth of California, and the demand far exceeds local production, the importation of hams, sides, etc., being an important item against the State in the balance of trade.

Going back a period of five years, this industry was extremely profitable, as hogs on foot commanded from five to eight cents the year round, according to quality, season, and demand; but not unlike other agricultural interests, prices have slumped to from two to five cents, and at the latter figure there is good money in hogs yet.

The Berkshire seems to be the standard breed, as four out of five breeders make their selection of this class of young stock, although the Essex, Poland, China, Durocs, or Jersey Reds all have their particular followers. Inasmuch as we are importing from five to six hundred cars per year of cured meats, it is quite apparent that there is ample room for the extension of the hog industry in California at the present writing. With ample facilities to grow the most fattening food, and fields of green forage in the shape of alfalfa, roots, etc., no business offers such inviting inducements as the systematic breeding of hogs for the market uses.

CONCLUSION.

I have only alluded to the most prominent descriptions of live stock which are being bred in California, and this State's adaptability for stock raising. Something might be said of the breeding of mules, which, during the season of demand, were extensively bred. Heavy sums were paid for imported jacks, and a spirit of rivalry existed among breeders as to who should produce the largest and best-formed animals.

Likewise, reference should be made to the Angora goat interest—a somewhat important one, as it seems to utilize wild, inaccessible land, otherwise without value. The grade kids are an excellent article of food, and the skin of the goat is tanned and made into gloves, furnishing an important article of commerce.

Diseases so disastrous to cattle and horses east of the Rockies are almost unknown here. All branches of the industry are conducted upon an intelligent basis, and earnest have been the efforts to breed up and improve every description of stock.

California can boast of the most extensive breeding farms in the United States, if not in the world. State pride in this particular prevails in an eminent degree, and during our ascendancy to supremacy each new triumph was hailed with joyful delight.

With such energy as we have already shown in this line, who can doubt that California will continue to keep her prominence, notwithstanding the present stagnation, as one of the leading stock-producing States of the Union?

Chas. M. Chase

"Behold the Holy Grail is found!—
Found in each poppy's cup of gold;
And God walks with us as of old.
Behold! the burning bush still burns
For man, whichever way he turns;
And all God's earth is holy ground."

—*Joaquin Miller.*

SPANISH MERINO SHEEP, TEHAMA COUNTY.

WOOL AND WOOL HUSBANDRY IN CALIFORNIA.

By John H. Wise.

IN the infancy of California's statehood was laid the foundation of her wool and sheep industry, which has, since 1850, grown to such an extent that California is nearly the largest wool-producing State in the Union.

As far back as the year 1855, to which we can trace authentic statistical records, we find that California produced about 175,000 pounds of wool, and after a period of twenty years this industry had been so carefully fostered and developed that, in 1876, the State of California produced nearly 57,000,000 pounds of wool.

Since 1876 there has been a gradual decline in the production of wool until last year, when the clip of California amounted to about 30,000,000 pounds. All of this marvelous and rapid development was not alone due to the profit attached to the raising of sheep and the growing of wool, but to the mildness of our climate, the abundance of ranges, and the richness of pasturage.

In the early history of the State, when California had a small population, there was a mere handful of sheep, which came mostly from New Mexico and the territories, yielding a very poor and coarse quality of wool.

After the discovery of gold, and the heavy immigration which was attracted to California by the mining excitement, came the development of agricultural and live stock interests.

The pioneer sheep—so to speak—were very poor in quality, both as to mutton and wool, but as California increased in population the sheep industry grew larger and more important, and the breed of live stock and wool was continually refined, and consequently we find that in a period of ten years—from 1854 to 1864—the clip of California increased from 175,000 pounds to nearly 8,000,000, and, in addition, the grade of sheep and wool was greatly improved in quality.

From 1864 to 1874 the production of wool had grown from 8,000,000 pounds to nearly 40,000,000, and from 1874 to 1876 there was a further increase of 17,000,000 pounds, making a total of 56,000,000 pounds, which was the maximum production in California since the foundation of the wool industry.

No industry has been more profitable in this State than that of sheep, and its satisfactory results are amply demonstrated in the immense production of wool and the enormous number of sheep which are now feeding on our ranges.

Although the woolgrowers raised many millions of pounds more wool in 1876 than they do to-day, this shrinkage is largely due to the fact that the *productivity* of our lands is so great for cereals and fruits that the illimitable abundance of free range which was accessible to the grower in 1876 is to-day absorbed by the farmer and orchardist; in other words, the character of the industry is changing, and must change, in order to accommodate itself to the rapid growth of agricultural interests.

For a number of years the sheepmen had the freedom of the entire State for grazing purposes, and it was not uncommon for growers to run as high as 30,000 to 40,000 head of sheep, and this was possible on account of the abundance and cheapness of range; neither was it considered more than ordinary for a woolgrower to own a band of four or five thousand. In those days, when pastoral interests were paramount, sheep and wool commanded high prices, and large fortunes were the result. Many of the richest men in California to-day laid the foundation of their wealth in the sheep business, and the opportunity which it gave them to study and learn the value of lands in California.

As California grew older and enlarged its agricultural interests, live stock shrank in number, and large owners either went out of the business or transferred their stock to territorial lands, where range was cheaper and admitted of larger bands.

To-day, however, California is one of the largest wool-producing States in the Union, and the opportunities for profit, both in wool and mutton, are as plentiful as at any time in the history of the State.

Although there are less sheep in California now than in former years, there are ample means to duplicate the number which the State had in 1876, because live stock no longer

depends upon the precarious chances of dry seasons, but has a continuous source of reliance in its lands that are made fertile and productive by irrigation.

Our sheep and wool to-day have been somewhat crippled by an unusual decline in value for the past four years, and as a consequence many growers have gone out of the business, and the product has been curtailed almost 10,000,000 pounds; but with the improvement which is bound to come through proper protective legislation, this industry will revive and be once again profitable, and our flocks and production of wool will materially increase.

The mild and equable climate of California makes the raising of live stock of all kinds, particularly sheep, peculiarily profitable and satisfactory. The sheep can be herded in bands of about 2000, and the losses of stock only result from natural causes, and not by reason of severities of climate. As a rule the growers clip their sheep twice a year, spring and fall, and the average product of a well-bred sheep is about ten pounds of wool, yielding, until recentyears, a revenue of about one dollar a head. This income from the wool was calculated to pay more than all of the expenses of running the sheep, and that which was derived from the sale of the mutton was safely considered a profit. In a former condition of the wool business, mutton sheep generally commanded from two dollars and fifty cents to three dollars and fifty cents a head. Higher prices have been obtained through exceptional circumstances, but these values were general.

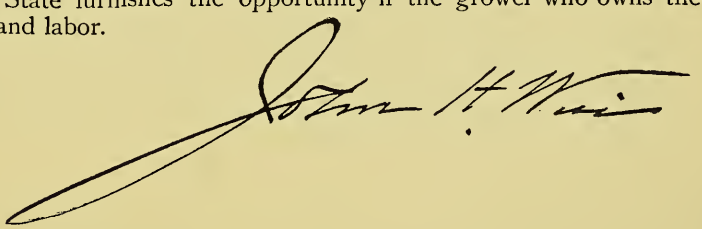
It is unnecessary in this chapter to discuss the wool situation in California to-day, because the tariff conditions have been such as not to make wool any more profitable here than elsewhere; but with the readjustment of the fiscal policy of the Government, the industry will be rehabilitated, and California offers more brilliant opportunities to stockmen who are interested in sheep and wool culture than any other State in the Union; but by growers already engaged in the business, and those who intend to embark in it, particular attention must be paid to the fact that, owing to the general absorption of all available range lands, it is absolutely essential for the future woolgrowers of the State to run their sheep in smaller bands, not to exceed 400 or 500, to aim always at perfection of the grade of the sheep and the quality of the wool, and to run the sheep in connection with some agricultural enterprise. In other words, there is no country in the world where the soil is capable of such a variety of production as in California, and as the new farmer must, in order to make a success, diversify his crops, he can easily support a few hundred sheep for mutton and wool purposes, thereby adding to his own profit as well as increasing the production and quality of wool in this State.

California's facilities for irrigation insure immense advantages over every other State in the Union, and the sheep industry can be carried on in California on a larger and more successful scale than now prevails in the State of Ohio.

By the disintegration of large bands into small ones, and the adoption of the industry by every farmer in the State, we will have an immensely increased production and a refined quality of wool that will always command the highest price in the market and yield an ample and satisfactory revenue to those who follow the industry.

To-day California supports 3,000,000 sheep on her ranges, worth over $6,000,000. We produced 30,000,000 pounds of wool, that will yield an income to the growers of nearly $3,000,000, and as the price of wool approaches its former value our sheep will multiply in number and our production of wool will naturally become much larger.

During the depression which has prevailed throughout the United States for the past three years, Californian lands, in common with others, have declined in value. Investors can locate in California very cheaply to-day, and embark in the sheep business, which in a short time will yield handsome returns. The record of all those who have engaged in the business, and who have conducted it conservatively and economically, has been one of continuous prosperity, and the same opportunities are offered to-day as were enjoyed years ago by the pioneers in the industry, but the modern demands of the business call for constant improvement, and the State furnishes the opportunity if the grower who owns the sheep will furnish the time and labor.



INDIGENOUS FORAGE PLANTS.

By W. S. Green.

THE indigenous forage plants of California are numerous. I think I have cut as many as ten varieties with a single stroke of the scythe, all of which made nutritious food for stock. All the flowering plants, as well as the grasses, make good hay; even some of the thistles make food for stock when cut at the right time. But the plants worth noticing are few in number compared to the whole.

First in importance is wild oats. This grain is like the tame oats of the East, except that it is not so large, and that it is provided with a crawling apparatus that, when wet, enables the grain to find any crack in the ground and thus bury itself. Oats covered the low hills of the coast counties, and contested the valleys of that region with clover, and alfilaria grew well on the foothills bordering the Sacramento and San Joaquin Valleys and the sinks and overflowed lands of creeks that ran across the valleys in winter, but which became immediately dry on cessation of the season's rainfall.

While the oat requires plenty of moisture, it always seeks well-drained land. It was our best forage plant, for the reason that it was the most extensive, and because it could be fed off green, and then the dry oats—owing to our peculiar seasons—was almost as good as hay until the fall rains came in quantities sufficient to cause the young oats to spring up among the dry; so that on good oat ranges there were but few weeks that stock did not fatten.

The omnipresence of the germ of the oat continues to puzzle old Californians. In any region in which oats grew wild, you may take a field miles square and cultivate it for a quarter of a century, never allowing an oat to seed, and let it lay for a year and the oat —if the season hits it right—will be in evidence to the extent of a good crop of hay! Nor is this phenomenon confined to land on which oats grew originally. The wild oats on good lands grew as high as seven feet, and as much as five tons of hay to the acre has been cut, but the tall oats did not make the best hay. Oats standing very thick and measuring not over three feet high makes the best hay. With all this, it is queer that California is not well adapted to the cultivation of tame oats.

Several varieties of clover are indigenous to our soil. A rich bur clover and a large red clover seem to be the favorites. The clovers made their appearance in the rich, low, well-drained valleys. Unlike the wild oats, the clover did not make its appearance every year. After a wet season one could see the clover taking possession of the rich little valleys; the oats coming down to near the foot of the hill, and then a seeming struggle for the survival of the fittest ensuing on land that was not exactly hill or valley. The clover lands were those of comparatively recent formation, although not covering every character of such lands. Clover would make more tons of hay to the acre than oats, and was regarded as a richer food, but still it was not so good a forage plant. When it dried out it would break up and blow away sooner; it would not stand the tramping of stock so well; the dry feed did not last so long, and it was much easier damaged by the early rains. And again recurs the queer circumstance that California is not so good a country for cultivated clover as the Eastern States.

Bunch grass is next in importance as a forage plant. It is found at the sea level and in high altitudes. It grows on well-drained areas, on land that most of us thought in early days was not good soil, because the bunches of grass were sometimes several feet apart, and because on the land between there was hardly any vegetation. "Bunch grass land" used to be synonymous for second-class land, but now the term describes good strong land—land that will wear well. It is a perennial plant, and makes splendid pasture, but except in a few of the mountain valleys is never cut for hay. It dies out under too much pasturing, and will not come again after cultivation—it refuses to be domesticated. And here again comes in the peculiar oats. Take a district of country, however large, upon which bunch grass has always grown indigenous, cultivate it for a term of years and then let it rest and it will come to oats!

These three indigenous plants, with the alfilaria, said to be of European origin, covered almost the entire valley and foothill portion of the state, and were the principal forage plants when the Americans took possession of the country. Alfilaria is a low plant, and will not turn off tons of hay like oats or clover, but is exceedingly rich, both as green feed and as hay. Stock of all kinds are very fond of the hay, and will pick it out from any other kind and eat it first. This plant grew on our high, well-drained, warm lands. It seemed to come with a certain amount of pasturing, but was easily trodden out, and has nothing like the persistency of oats or even of clover.

Along the margins of the streams that overflowed their banks, and at the same time drained off well, there grew a pea vine that furnished more forage per acre than any plant we can claim as indigenous, but it generally grew interspersed with brush and briars, and it seldom happened that there were many unbroken acres of it. The bottoms where it grew, sometimes to the height of eight or ten feet, were always valuable for pasture. The peas were very small, and there were not very many pods on the vines. I never saw much of it cut for hay, but the hay was good for cattle—not very good for horses.

We had a "blue-joint" grass that cut some figure in indigenous forage. It resembled sedge, and grew on land on which water had stood. It grew to the height of perhaps two and a half feet. It was tough, and stock would eat other grasses all around it, and the hay was not first class.

The old-fashioned lamb's-quarters is indigenous in California, grows on hard adobe or alkali soils, and often made seeming barren land valuable pasturage, especially for sheep. It is exceedingly rich in seeds. Next to acorns it furnished the principal food for the Digger Indians. With a fan-shaped implement made of willow twigs the squaws would thresh the ripe seeds into baskets. These baskets of seed would be carried to the home and pounded into meal in stone mortars. The best time for sheep pasture was after the ripe seeds had fallen to the ground, from which the sheep would lick them up; and thus it would often happen that one would see fat sheep where he could see no forage.

We had large areas of overflowed lands on which grew a rush we called tule, and hence such lands came to be called tule lands. This plant is valueless as food for stock. It grows to a height of ten to fifteen feet, but there is no substance to it. On the edges of the tules, however, and on spots, there grew several kinds of swamp grass that made passable pasturage and fairly good hay. It sometimes happened that clover would follow up the receding water, and when it did it grew thick and high.

Of late years there has appeared a plant we call foxtail, which is a valuable forage plant when green, but is absolutely worthless when it begins to dry, and it is not good for hay. It is hard to distinguish from the wild oats when green. Its seeds are contained in a fox-tail-fashioned head, light and fuzzy. People who have to walk through it tie the bottoms of the trouser-legs with a string, but even this precaution does not always prevent the creeping foxtail from effecting lodgment in the clothing of trespassers on fields of this grain.

In the mountain valleys there are wild timothy and redtop, wild rye, buffalo grass, and the bunch grass of lower altitudes, and swamp grasses of various kinds.

W. S. Green

The rose entwines the orange-tree, the sea-winds rock the pines,
And wheat-sheaves lift their golden heads amid the clustering vines;
The latest glow of sunset still enfolds them evermore,
While Strength and Beauty stand hand-clasped, upon this Western shore.

—*Carrie Stevens Walter.*

RELIGION AND THE CHURCHES IN CALIFORNIA.

By the Rev. Horatio Stebbins, D. D.

IT has been said that wherever the American people go, establishing new States or extending the empire of constitutional freedom, their first care is to found the institutions of religion and education. To this great historic fact, California gives most substantial confirmation. The common school is in every valley and on every mountain side, an expression of the public opinion of society; and private gifts for education are distinguished. It is believed that according to population and period of political organization, no State in the Union has richer public provision or private endowments for education. The University of California, established thirty years ago, already has an honorable rank among the institutions of the country. The recent establishment of the Leland Stanford Jr. University, by private endowment, is an illustrious instance of far-seeing public spirit, to be perpetuated in a great and powerful institution. The Cogswell, Lick, and Wilmerding technical schools are destined to have great influence in raising the standard of intelligence in the common arts and industries of life.

At the period of the American conquest the organized form of religion was in the hands of the Roman Catholic Church. That ancient Church possessed the land, and did much to cherish and sustain the religious sentiment of a people widely scattered over vast areas, or gathered in small communities here and there in valleys that afforded pasture, or near the sea, where cove, inlet, or bay gave protection to ships that came for trade and barter along the coast. At present the Roman Catholic Church is the largest religious body, including about one third of the population of the State, and having a Church property valued at about three millions.

The rest of the population is divided among the different sects of Protestantism, and that large class who, without special religious affinities, have the natural moral and religious instincts of humanity. Without going into any exact definitions, or giving too much importance to statistics, the Church property in California may be valued at about twelve millions, and is all taxed as other property is taxed. This, as a "showing" of material facts, compares favorably, considering population and period of settlement, with Ohio, Illinois, or Minnesota.

Concerning the spirit of religion in California, there is nothing peculiar, unless we take into consideration the conditions of the early American occupation of the country. Men were attracted here by the presence of the precious metals. That presence unsteadies the mind and unsettles the great ethic of property. As a broad, general fact, men are governed by their habits and not by their principles. In the face of this great moral fact, California society presents a most striking instance of the superiority of man's moral and religious sentiments, without a parallel in the history of our own or any other country. Far away, on a lonely shore, to which men of all races and tribes fled like birds of prey to their quarry, there has been established a State founded on justice, freedom, and truth.

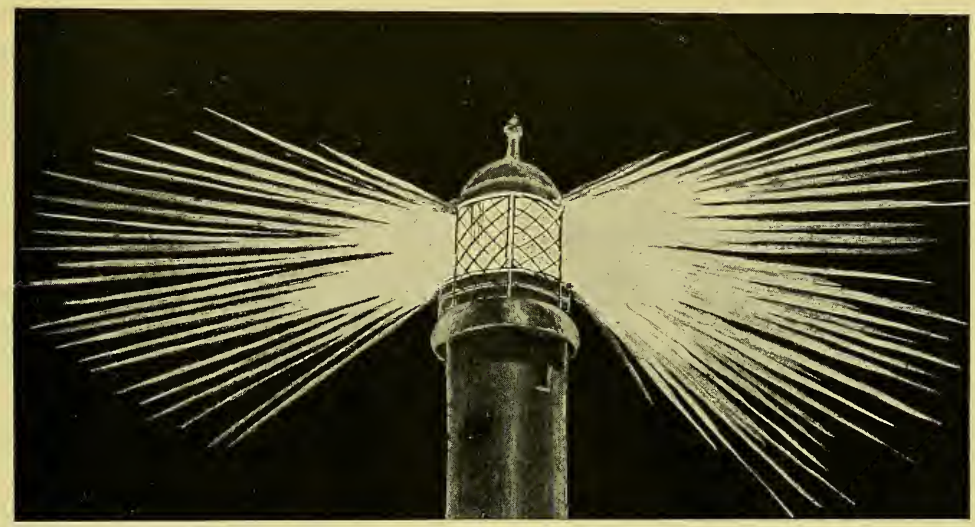
The people of California are inclined to attach less importance to accurately formulated religion, and trust more to the great primary principles of manhood, honor, justice, and kindness, according to common sense, right reason, and a simple faith.

Horatio Stebbins.

EDUCATION IN CALIFORNIA.

By Professor Martin Kellogg.

THIS State was settled by intelligent people. As soon as the first rush to the mines was over, men began to re-establish their homes and to care for the welfare of the children. Private schools were opened, then public schools. The first Constitutional Convention looked far ahead, and even made forecast for a university. Californians were proverbially generous, and as need required the public



schools were placed on a solid basis. It is nearly fifty years since the immigration of 1849; what has the State to show for the important interest of education? Let us begin with the common schools.

In all the cities and larger towns of the State, and in most of the country districts, good schools are maintained during the greater part of the year; usually about nine months. For the school year 1895–6 the funds from the State apportionment amounted to over three millions; from local taxes, to more than two and a half millions; from all sources, to more than six and a half millions. The teachers receive a fair compensation, and the teaching profession is held in high esteem. Of course most of the common-school teachers are women, and, as a class, they represent a good degree of general culture. The avenues of admission to the profession are carefully guarded. A large number of these teachers have received diplomas from a State Normal School; many have graduated from

high schools; some have pursued the higher range of studies found in the college courses of the universities.

The standard of excellence in this profession has been much advanced within the last ten years. University courses have prepared teachers for the high schools; better high school and normal school instruction has given better teachers to the grammar schools. Three normal schools exist already, situated at San José, Los Angeles, and Chico. A fourth was established at San Diego by the last Legislature, but is not yet in operation. The principals and teachers in these schools have ranked high in their profession. San Francisco has a city normal school, to which high school graduates are admitted for a year's additional work. In addition to our own supply of teachers, we have received continual accessions from the normal schools, high schools, and colleges of other States. Teachers find it easy to drift across the continent in search of a milder climate or a more hopeful field of professional activity.

Mention must be made of provisions for children below the ordinary school ages (the school census includes children between the ages of five and seventeen). Kindergartens sprang up many years ago in San Francisco, established and fostered by such wealthy and large-hearted women as Mrs. Leland Stanford and Mrs. George Hearst. Mrs. Sarah B. Cooper became a kindergarten apostle for the city and State, and devoted a large share of her remarkable activities to this work. The purpose of these kindergartens was at first charitable, to rescue the waifs of the city streets from the evil influences about them; but as this instruction proved its value for all young children, the kindergartens have ceased to be looked on as missionary enterprises, and paid kindergarten schools are now patronized by all classes of society. They are to be found in all the chief towns of the State, and are recognized as a permanent factor in the education of the children. In more than half a dozen cities or large towns they have been incorporated into the public school system. San Francisco has not yet adopted them, but there is a strong movement in that direction.

The regular public school system is organized into a series of eight or nine grades. The lower grades are designated as primary, the upper as grammar grades. In some cases the lowest grade is subdivided, especially where it is over-crowded with new-comers of unequal attainments. Ungraded schools are now found only in the most scattered populations of the country districts. The studies of this graded system are ordinarily expected to occupy nine years. As some schools are in session fewer months than others, the years are not always parallel in results. In all such schools there will be uneven progress, owing to differences in ability, in home training, in health, and in favoring circumstances. But the graded system is best for the average pupil, and is sufficiently elastic to allow free scope for the most forward.

High schools receive the scholars who wish to go beyond the grammar grades. In all the larger communities the country over, high schools are supported as a necessary part of an educational system. In California the State Constitution left them out, and they depend entirely on local support. But subsequent legislation has provided methods for their establishment by local procedure.

The cities and larger towns organize them as a part of the city or town system; others are established by district or by county action. Much interest has been developed in this direction, and the number of high schools has increased rapidly during the last few years. There are now a hundred of these schools in the State.

The teachers in these schools are largely college graduates. It is a recognized principle that teachers in any school must be much in advance of their pupils. In the grammar grades the least that can be asked is, that the teachers shall have taken the High School courses. In the high schools the same principle requires that the teachers have the advanced culture of the college courses. From our own universities and colleges, and from Eastern institutions, a good supply is found for the teaching work of the high schools.

One important function of the high school is to prepare students for the higher college courses. It is a necessary connecting link between the common school and the university; but the greater majority of the high school students go no further. Their needs are met by an elastic arrangement of the courses. The courses leading to the university are diverse in aim, and thus furnish studies of widely varying character. Other studies are introduced, and other collocations of studies for those who are to end their

formal education with the high school. This secondary education, as it is called, has come to assume a very important place in the local communities. In literature and history, in languages, in mathematics, in the natural sciences, a range of instruction is offered which used to be found only in the old-time colleges, and some of it was lacking there. The modern high school is in reality the people's college brought close to the people's homes.

Following up the State system of education, we come to the university, which stands at the head of the system. Our State university was organized by law in 1868, and began its work of instruction in the autumn of 1869. Different factors entered into its organization. The most decisive of these was the national grant of public lands by the Morrill Bill of 1862. This bill aimed especially to encourage education along the lines of agriculture and the mechanic arts. The next most decisive factor, and not less potent, was the surrender by the College of California of its property, name, and good-will, in favor of the broader institution. That college had made creditable advances in promoting the higher education in this State, and turned over to the university the magnificent site now occupied at Berkeley. The State added university funds reserved for such a purpose, with a special tide-land endowment. It appropriated money for the first buildings at Berkeley, and, in later years it made some special appropriations for certain departments. In 1887, and again in 1897, it set apart for the university a tax of one cent on a hundred dollars of valuation; or, in the terms used in other States, one tenth of a mill on the dollar. This last subsidy was voted with entire unanimity by both houses of the Legislature.

Private benefactions have been added, but more tardily than to the Atlantic universities. Edward Tompkins gave the first endowment of a professorship, D. O. Mills the second. The Reese Library, the Bacon Art Gallery, the Harmon Gymnasium, bear the names of private donors. Many minor gifts were received from time to time. Last year, Mrs. Phebe A. Hearst offered to erect two permanent buildings worthy of the university; and anonymous benefactors have promised to follow her example. She is now waiting for the completion of a harmonious plan for the whole site, to be furnished by a competition of superior architects in this and other countries; and she bears the expense of securing the plan. In a very few years, therefore, Californians expect to see the beginning of such construction on this unrivaled site as will be worthy of a great university. It remains for the public-spirited and far-seeing citizens of the State to be equally generous in endowing the many important chairs of instruction.

In numbers, the university already holds a very respectable place among the universities of the land. The register for this year shows a total of 110 on the teaching staff of the academic departments at Berkeley, and of 130 in the Affiliated Colleges in San Francisco. Three hundred and forty-three separate courses of instruction were given at Berkeley. The students at Berkeley number about 1500; in San Francisco about 720—in all, 2220. The colleges in San Francisco are those of law, medicine, dentistry, pharmacy, and veterinary science; also the Mark Hopkins Institute of Art, in the splendid home reared by Mr. Hopkins and presented to the Art Association by Mr. E. F. Searles. The Lick Observatory, at Mt. Hamilton, is a constituent part of the university. Under the care of the Regents is also the new Wilmerding School, for educating boys in mechanical employments.

Education in California has much to show outside of the organized public system. Private schools and institutions of all grades, from the kindergarten to the secondary school, the college, and the university, have received a large patronage. Especially noteworthy are the schools which furnish preparation for college courses. Some of these rival the best high schools, and are patronized by many in preference to the public school. Yet the high schools, with their free instruction and their well-developed courses, satisfy the great majority of parents. Their efficiency has been greatly increased by a close connection with the State University, under a very thorough system of accrediting. The leading private schools of a like grade seek the same recognition, by which pupils are admitted to the university without examination.

The Roman Catholic educators of the State have built up numerous flourishing parochial schools, and have planted colleges in some of the chief cities. Different religious denominations have devoted much effort to the establishment of colleges and academies and theological seminaries. The Mills College for young women has grown out of a flourishing seminary established near Oakland. The Belmont School for Boys has incorporated

as a permanent institution, retaining as its principal the founder, President Wm. T. Reid. The Throop Polytechnic School, at Pasadena, has a foundation which promises well for this division of advanced education. The Lick Mechanical School, in San Francisco, prepares students for handicrafts, and has a course leading to the Colleges of Science. Other schools make a specialty of manual training, and some of them are incorporated into the public school system. During the year 1896 the number of children between the ages of five and seventeen who attended private schools was set down as 21,405; in San Francisco alone, 9070.

By far the most important institution due to private munificence is the Leland Stanford Junior University, founded by Senator Stanford, and situated at Palo Alto. It was opened in 1891 with a full and able corps of professors and a very large attendance of students, many of whom followed the new professors from institutions beyond the Rocky Mountains. President David Starr Jordan is at its head. Since the death of the founder, Mrs. Stanford has devoted herself, with great success, to the management of the properties constituting a part of the ample endowment of the university. The buildings already erected are unique in construction. The attendance of students is about 1100.

Ten years ago the State University had an attendance, at Berkeley, of barely 300 students. Now these two universities, California and Stanford, have an attendance of over 2500 academic students. No other State can parallel this increase within the last decade. The stimulus has not been to college training alone. The high schools of the State have received fully as great an impulse. The whole line of common schools has felt the benefit of this increased desire for higher and more thorough education. Private institutions have shared in the new enthusiasm. California may well congratulate herself on the educational outlook for the future.

Martin Kellogg

POLITICAL STATUS OF CALIFORNIA AS DETERMINED BY ELECTION STATISTICS.

By Horace Davis.

A DISCUSSION of this question involves substantially a political history of the State, or at least a review, not only of the figures, but of the causes producing political changes from election to election. My own political bias, being towards the Republican party, may influence my view of the causes at work, but it cannot change the figures; a Democrat might find different reasons for the fluctuations.

In considering these figures we hardly need to go back beyond Governor Low's election in 1863, when the State first fell into line with a decided Republican majority, but for a better understanding it may be useful to give the vote of 1860 and 1861, as marking the changes.

There are three ways of expressing the popular voice which are worth considering. First, the Presidential vote; second, the vote for Governor; and third, the Congressional vote. By considering the three we shall in the long run pretty well eliminate local influences and considerations of personal popularity or unpopularity. Therefore, I will first take a general historical review of the successive elections in their regular order, and the causes at work to produce the political fluctuations; then we will note the varying result in each class of elections; after which we shall be ready to draw our conclusions.

Prior to 1860 California had in the main been Democratic, but that year four tickets were in the field; the American party headed by Bell, the Republican represented by Lincoln, and the two wings of Democracy called after their respective leaders, Douglas and Breckinridge; amid all this political confusion Lincoln carried the State by the slim

plurality of 711 votes, though polling only 32.3 per cent. of the entire vote cast. The next year Stanford, the Republican candidate for Governor was elected by 23,286 plurality, though still slightly short of an actual majority.

In 1863 the Republicans under Low polled 59 per cent. of the entire vote, with a majority of 19,602; this was the high tide of Republican success. The next year Lincoln carried the State by 18,293, with nearly the same plurality as Low.

In 1867 came a great change. The war was over; the reconstruction measures of the Republicans displeased many voters; their candidate for Governor was unpopular, while Haight the Democratic leader was much respected, and he won by 7458 plurality, with 54 per cent. of the total vote; but in the Congressional vote of the same year the aggregate Democratic majority was only 3910.

In the next year's Presidential canvass Grant carried the State by the meagre majority of 506. The Congressional elections of the same year gave an aggregate Republican majority of 675.

The Gubernatorial term had been lengthened in 1862 from two to four years, so that we had no general State election till 1871; that year Booth carried the State for the Republicans by 5,061 majority; which was slightly exceeded by their Congressional majority of 5474.

In 1872, the Democrats were demoralized by the nomination of Greeley, and the State went for Grant by 12,234 plurality, polling almost the same number of votes as he did four years previously, while the Democratic vote fell off 14,000; the total Presidential vote of the State being actually 12,854 less than in 1868. The Republican Congressional majorities were only 2470.

The State election in 1875 was a three-cornered fight. The Republicans were divided on local and personal issues, and lost pretty much everything. Irwin, the Democratic candidate for Governor, was elected by 30,187 plurality, though polling only 50.2 per cent. of the vote. The Democratic Congressional majority was 18,899.

But the next year, in the National canvass of 1876, the divisions were healed and the two old parties met with solid front. Hayes carried the State by a majority of 2821 in a total vote of 155,767. The Republican Congressional majority was 6,792.

The next three years were a period of great political confusion. The hard times, which at the East led to the Greenback movement and the Bland Bill, had fairly reached the Pacific States; aggravated by the failure of the Comstock Lode, they resulted in the New Constitution movement, the crusade against Chinese immigration, and the Kearny riots.

The election of 1879 was a three-cornered fight between the Republican, Democratic, and Workingmen's tickets. The Republicans carried the day, electing Perkins by 20,300 plurality, though polling only 42.4 per cent. of the entire vote. Their Congressional plurality was only 11,228.

The Civil War issues were losing their force, and at the next Presidential canvass in 1880 Chinese immigration became a prominent factor. Hancock, the Democratic candidate, carried the State by the meagre plurality of 114 votes, one Republican elector being chosen, out of six. The Greenback candidate polled two per cent. of the entire vote. The Republican Congressmen, however, had a plurality of 612.

By the New Constitution the State election was brought on the even years, and in 1882 the Democrats swept the State, polling 54 per cent. of the entire vote, and electing Stoneman by 23,519 plurality. This was the highwater point of Democracy in the State. The issues which brought about this landslide to Democracy were mainly the railroad question and Chinese immigration. The Democratic Congressional plurality was 15,921. The Prohibition and Greenback vote was very light this year.

In 1884 the Republicans recovered their strength and carried the State for Blaine by a plurality of 13,181. The principal motives in the canvass were the tariff and Blaine's personal popularity. The outside vote was very light. The Blaine ticket polled about 52 per cent. of that cast. The Republican Congressional plurality was only 10,382.

In 1886 came another drawn battle. In a total vote of 195,660, the Democrats elected Bartlett as Governor by a plurality of 652; they gained also half the State ticket. The Republicans elected their Lieutenant-Governor, the rest of the State ticket, and four out of six Congressmen. The Republican Congressional plurality was 2211. The independent vote for Governor amounted to over 26,000.

In the Presidential canvass of 1888 the Republicans scored a substantial victory,

casting very nearly 50 per cent. of the entire vote, and choosing their electors by a plurality of 7111 in a total vote of 250,220, while their Congressional plurality was 10,320. About 8000 outside votes were cast for President.

At the State election of 1890, Markham, the Republican candidate, was elected by 7945 plurality, polling 49.5 per cent. of the total vote, 252,457. The scattering vote was over 10,000. The Republican Congressional plurality was 8396.

The Presidential election of 1892 was very closely contested, Cleveland winning by only 141 plurality in a total vote of 269,585; the margin was so close that one Republican elector, Bard, was chosen. The Presidential vote for Populist and Prohibitionist amounted to over 33,000. The Democratic Congressional plurality was 16,343. This was partly due to a fusion with the Populists in the Sixth District, but deducting that vote there still remained the handsome plurality of 6500.

At the State election in 1894 the Democratic candidate for Govenor was chosen by 1206 plurality; but the Republicans elected the rest of the State ticket by pluralities ranging from 17,380 for Superintendent of Schools to 40,857 for Treasurer. The Republican Congressional plurality was 21,201; part of this was due to a split among the Democrats in the Fifth District. The total vote for Governor was 284,548, of which 61,865 were cast for Prohibition and Populist candidates.

During the decade from 1884 to 1894 the Republicans have evidently gained considerable strength from the influx of Eastern people into the southern part of the State, and secondly from the growth of the tariff sentiment due to the increase of fruit and wine production. Now we come to a new issue, the sound money question, and the battle of 1896 was fought out mainly on this ground; 296,127 votes were cast, of which McKinley polled 49.2 per cent., having an average plurality of 1800 and securing eight Presidential electors, while the Democrats succeeded in choosing one. The Democrats and Populists were united, so that the outside scattering vote was only 6500. The Republican Congressional plurality was only 848.

This closes our historical record, and before going farther I ought to give credit to McCarthy's statistician for most of the figures quoted above. Now let us bring all these figures together into one body that we may see their meaning. For this purpose I have constructed a Table of Pluralities, which tells the story of the whole thirty-seven years at a glance.

TABLE OF PLURALITIES.

	PRESIDENT.		CONGRESS.		GOVERNOR.	
	Rep.	Dem.	Rep.	Dem.	Rep.	Dem.
1860	711	. . . .	. . . .	. . . .	. . . .	. . . .
1861	. . . .	. . . .	15,747	. . . .	23,286	. . . .
1863	. . . .	. . . .	21,333	. . . .	19,602	. . . .
1864	18,293	. . . .	18,160	. . . .	. . . .	. . . .
1867	. . . .	. . . .	. . . .	3,910	. . . .	7,458
1868	506	. . . .	675	. . . .	. . . .	. . . .
1871	. . . .	. . . .	. . . .	5,474	5,061	. . . .
1872	12,284	. . . .	2,470	. . . .	. . . .	. . . .
1875	. . . .	. . . .	. . . .	18,899	. . . .	30,187
1876	2,821	. . . .	6,792	. . . .	. . . .	. . . .
1879	. . . .	. . . .	11,228	. . . .	20,300	. . . .
1880	. . . .	114	612	. . . .	. . . .	. . . .
1882	. . . .	. . . .	. . . .	15,921	. . . .	23,519
1884	13,181	. . .	10,382	. . . .	. . . .	. . . .
1886	. . . .	. . . .	2,211	. . . .	. . . .	652
1888	7,111	. . . .	10,320	. . . .	. . . .	. . . .
1890	. . . .	. . . .	8 326	. . . .	7,945	. . . .
1892	. . . .	141	. . . .	16,343	. . . .	. . . .
1894	. . . .	. . . .	21,201	. . . .	. . . .	1,206
1896	1,800	. . .	848	. . . .	. . . .	. . . .
	56,707	255	130,305	60,547	76,194	63,022

The Republicans have won eight Presidential canvasses, the Democrats two; the Republicans have pluralities in eleven Congressional elections, the Democrats in five. Clearly, then, in national matters the State is Republican. In State elections the lines are

not so clearly drawn; as we descend from national to local issues, the position of the State becomes more uncertain, though it still has a decided Republican preponderance.

To get a different perspective, let us examine the figures from another position—from the standpoint of time. Let us divide the thirty-seven years under review to three nearly equal periods,—the first from 1860 to 1872, the second from 1875 to 1884, the third from 1886 to 1896. In the first period the elections were controlled by the Civil War issues, and the State was unquestionably Republican. In the second, the hard times, the Chinese Immigration, and the railroad question came to the front, and in local issues the State decidedly leaned to the Democracy during this decade, though in the main Republican on on national questions.

During the ten years from 1886 to 1896, the State resumes her place in the Republican column with considerable certainty. I attribute this, as before said, to the immigration into the southern part of the State, and to the increasing interest in a protective tariff. It may be claimed that the canvass of 1896 was fought on new issues, partly outside the old party lines; but if we deduct this, it does not materially change the result. As shown by the election statistics California remains a Republican State.

CALIFORNIA'S CALL TO THE IMMIGRANT.

By John P. Irish.

(Chairman Committee on Immigration, California State Board of Trade.)

IT is not pretended that California supplies any specific from the wealth of her soil and sunshine that will cure unthrift, bad judgment, and lack of faculty, or make of the do-less a doer. But there is legitimate basis for the belief that here the average man may work in greater comfort more days in the year and earn his bread easier than under Eastern conditions.

California is a winterless land. No deep frost chills the ground; vine and fig tree don't have to thaw out as a preliminary to going into business as fruit-bearers. All the stone fruits, and the fig, pomegranate, orange, lemon, lime, pear, and apple are precocious bearers. The peach will bloom the second year from the pit. On the Mediterranean the olive fruits meagerly at seventeen years of age; here it bears a full crop at seven. In the East he must be a young man who plants a tree expecting to repose in its shade or to eat its fruit. Here old men may plant, and surely expect to enjoy the results. The growth of animals is not checked here by withering winter, and a yearling horse is the equal of an Eastern two-year-old.

But, it may be asked, is not this precocity of animate and inanimate life compensated by early decay? The answer is, No. That rule has here its exception. The peach tree that blooms before the shell of the pit that bore it is decayed, bears on for thirty years or more. Olive trees that furnished oil for the sacraments to the old Mission fathers a hundred years ago, shade the graves of the gardeners who planted them, and ripen their yearly crop with unabated energy.

But men fail in California? Yes. Men who buy land and hire it planted and worked, running it on the absentee landlord system, fail here and everywhere. So do men fail who run manufactures and trade on the same system. But men who take here only so much land as they can till and tend with the labor of their own families, do not fail, for here Nature helps the industrious hand, and nowhere else does intelligent labor add as much to the value of land, for the reason that here Nature holds one handle of the plow.

The advantage that California has in a climate where growth and production go on without pause, is seen when a farmer finds his vines and trees, fields and truck-patch, producing something for the market every month in the year.

What effect does the climate have upon the cost of living? Where the pastures yield natural forage, green or dry, every day, where the waters never freeze, where vegetable growth goes on forever, and the storage of vegetables for winter use is unnecessary, because they are growing and fresh daily, it is natural that the cost of living should be less than where the summer and fall are spent in hard labor to store food and fuel against the long winter that suspends production. Beef and mutton from the ranges and fish from the waters, fruit and vegetables, reach market here in a condition for use more cheaply than elsewhere.

The economic value of climate should be considered in selecting a home; first, in respect to the health of the family, and, second, in respect to the number of days yearly in which your vocation may be followed. California, it may be said, has no endemic diseases. Except in the high Sierra Nevada Mountains, the snow does not impede outdoor occupation. There are no tornadoes or chilling blasts, nor are there any sudden changes in temperature which imperil life. The heat in the valleys, though high as indicated by the thermometer, is not excessive enough to prevent labor in the fields in the hottest days; because the air, being dry, the latent heat of the body is rapidly eliminated, and the blood is kept cool.

It will bear repetition that every day in the year is a working day. It follows that it costs less to live in California than in any other State in the Union, and the comfort of life is greater. The retail prices of food average about as follows: Meat, 8 to 15 cents per pound; flour, $2 to $2.50 per 100 pounds; corn meal, 10-pound sack, 25 cents; graham flour, 10-pound sack, 30 cents; potatoes, 1½ cents per pound; turnips, 12 cents per dozen; cabbages, 1½ cents per pound; onions, 1½ cents per pound; green corn, 30 cents per dozen; fresh butter, 20 to 25 cents per pound; firkin butter, 10 to 20 cents per pound; eggs, 25 to 35 cents per dozen; hams, 15 to 18 cents per pound. Dried fruit, per pound — apricots, 10 and 12 cents; apples, 8 and 10 cents; peaches, 10 to 16 cents; prunes, 8 and 10 cents; pears, 7 and 9 cents; figs, 5 and 8 cents. Ripe fruit — apples, 50 cents per box; pears, 50 and 75 cents per box; peaches, 40 and 60 cents per box. A comparison with Eastern prices will show the margin in favor of California.

It easily suggests itself that the equability and high temperature of our winterless climate permit you to build a house at one half the cost of a house in a winter country. The intending settler should fix firmly in his mind the topography of California. We have a winter season called "wet," and a summer called "dry." In the winter months the average rainfall is about twenty-five inches, distributed through four months of the year, and this is more than sufficient to insure abundant crops. California is about 850 miles long, and contains 158,360 square miles. Her coast line extends as far as from Boston to Savannah. At the same altitude the climate is practically the same in the north as in the south of the State; hence, San Diego in the south and the country 600 miles north produce identically the same crops. On the west slope of the Sierra Nevada Mountains, at an elevation of from 400 to 1000 feet, is the famous foothill warm belt, stretching from Shasta to Kern County, and noted for the superiority of its fruits, including the fig, orange, lemon, and olive. There is one great valley; its south end rests on the Tahachapi Mountains, and its north end is lifted up by Mount Shasta. This great trough sags in the middle, and the rivers that run from each end escape into San Francisco Bay through a common delta. From these rivers we name each end of the valley, thus giving the impression that there are two valleys. The north end of the valley is the valley of the Sacramento, with an area of 4,000,000 acres. The south end is the valley of the San Joaquin, with 7,000,000 acres. This valley is the seat of wheat and raisin culture. On the west of this great valley rises the Coast Range, in which lie a number of fertile and extensive valleys; such as Santa Maria, Sonoma, Napa, Salinas, Santa Clara, Vaca, and Suisun. In most of these, fruit-growing is the principal industry. The slopes of the Coast Range, toward the sea, and the high Sierra, are favorable to dairying. To some extent, therefore, the settler is guided in the selection of his residence by the business he desires to pursue.

Our industry is manifested by the fact that, while the population of the State is about 2.20 per cent. of the population of the United States, the true value of the property of the State is 3.20 per cent. of the true value of property in the United States, according to the census for 1890. Or, to put it in another form, the valuation per capita in the United States was $1036, while in California it was $2097. The output of gold last

year was about $18,000,000. The yield of wheat annually is about 30,000,000 bushels; barley, 16,000,000; and corn, 6,000,000, and the value of fruit in all forms is not less than $30,000,000.

We expend annually $6,000,000 for the maintenance of the public schools. There are ninety high preparatory schools for the University and six normal schools. At the State University there are 1500 students, and at the Stanford University 1100 students.

The State is entirely out of debt. The financial report shows that the State debt is about $2,500,000, but this is only a form of statement. There is that amount of State bonds, but the bonds are owned by the State and are covered into the State School Fund. The State pays the interest to the School Fund, which is annually apportioned to the public schools.

Taxation is not burdensome. It is true California has numerous public institutions—penal, corrective, and charitable—but when the cost per capita of maintaining their inmates is examined, in comparison with the cost in other States, it is shown that public administration here is not extravagant.

The cost per capita, per day, of convicts is, in Illinois, .4027; Wisconsin, .3550; Iowa, .3643; California, .3333.

The average cost per capita, per diem, of insane in Illinois, Wisconsin, and Iowa, is .4607; in California, .4539.

The cost of homes for the blind in Illinois, Wisconsin, and Iowa, per capita, per diem, is .837; in California, .440.

Compared with the cost of these institutions in New York, California makes an equally favorable showing, as follows:—

	N. Y.	Cal.
Convicts	.38	.3333
Insane	.51	.4539
Adult blind	.87	.44

All of the foregoing figures are for the fiscal year ending June 30, 1895.

It is apparent, then, that if California has a reputation for public extravagance, it is undeserved, and the intending immigrant need not hesitate for fear that his interests will suffer by reason of high taxation, due to the waste of public money.

It is not given to all men to be wealthy; but every original fortune in this country was founded in some man's determination to make a living, and provide for life's decline when labor is impossible. Immigration flows where a living may be made under the most favorable conditions. The variety of resources in California invites an equal variety of tastes, training, and experience. If a man desire to mine, look at the map in this book. Along the western flank of the Sierra Nevada Mountains, for 800 miles, is the world's greatest gold field. It has already yielded $1,000,000,000 from the merest scratching of its surface. Chemical and mechanical improvements have taken nearly all of the element of chance out of mining, and a man may consider that occupation now as he may farming or fruit-growing, trade or manufacturing.

Horticulture here rises to the rank of a profession. Our soil and climate are so adapted to it that fruits from every zone may be grown. The clemency of our climate and its halcyon quality invite enterprise and ingenuity to experiment in all horticultural refinements. By hybridizing and the tendency to "sport" inherent in the climate, we have added largely to the varieties of fruits and nuts. Here has been the only successful experiment in hybridizing the soft berries by which the blackberry and raspberry have been combined in a new fruit of the finest quality and productiveness. Since God planted a garden, eastward in Eden, no equal area of the earth's surface has produced profitably a variety of the fruits of tree, vine, and shrub, equal to that of California.

The beginning of all successful manufacture is in the transmutation of the most abundant raw material into more merchantable or more permanent forms, for transportation and use at a distance. The State is not yet sufficiently supplied with plants for drying and canning our surplus fruits, or for reducing them to fine jellies, jams, pickles, pastes, etc.

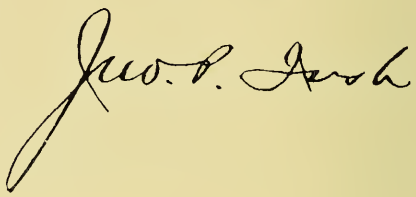
Immigrants who have a taste for these arts will find here a growing field. No place presents better facilities for variety farming as it is practiced in the Mississippi Valley. With a small tract of land, which may be cared for by the labor of an ordinary family, with some orchard and vineyard, bordered with almond and English walnut trees, producing some alfalfa and grain, and carrying some cows, pigs, and chickens, the owner will find

something produced for market every day in the year, while his family living will nearly all come directly from the soil he tills.

If commerce be attractive to the immigrant, he will see at once the advantage of handling the great variety of products offered for exchange in the markets of the world. The commerce of San Francisco averages, per annum: —

Domestic products	$70,000,000	Exports East, by rail	$50,000,000
Foreign imports	60,000,000	To interior points	20,000,000
Exports	60,000,000		
Total			$260,000,000

The reader will find the subjects herein generalized treated in greater detail in the other chapters of this book. This treatment is conservative, and is intended only to invite that careful personal examination which the prudent man makes who desires to better his condition by changing his place of abode. We who are here in daily contact with what Nature has wrought out are so fond of our State that we believe the intelligent and industrious immigrant will soon be able to say: "The lines are fallen unto me in pleasant places; yea, I have a goodly heritage."



CALIFORNIA AND THE INSANE.

By A. M. Gardner, A. M., M. D., Superintendent Napa State Hospital.

IN the year 1851 the first State hospital for the care, custody, and treatment of the insane was erected in the city of Stockton. At various times since the above date, there have been established by legislative enactment four other State institutions, all of which are devoted to the same ends; making in all five State hospitals that are to-day engaged in this charitable work. Upon the 30th day of April, 1897, the total number of insane under State care in California numbered 4814. Probably 125 insane persons are being cared for in private asylums.

Early in the history of the State it was determined that the insane should become the wards of the State, and ever since the opening of the hospital located at Stockton, up to the present, the State of California has assumed the entire control, custody, and treatment of its insane. That system of caring for the insane which recognizes them as wards of the State is known as *State care* in contradistinction to that system which permits a certain proportion of the insane in any State to be cared for in prisons, jails, and county almshouses.

STATE CARE AS COMPARED WITH ALMSHOUSE AND PRISON CARE.

A brief comparison of these methods of caring for the insane should now be made in a discussion of this subject, in order to make clear certain propositions that will be considered later on. There is a wide-spread concensus of opinion among those who have an extended experience in dealing with the insane, that State care affords the best means and methods for the protection of these unfortunate people. Many of the worst horrors that have been connected with the management of the insane during the past fifty years have found a breeding place, and have been carried to their full consummation within the walls of prisons, county jails, and almshouses, abodes in which an uncertain number of the insane are still maintained in several of the Eastern States.

As stated before, California had early learned this lesson of humanity, and commenced its practical application, viz. State care. New York has recently learned the same lesson, and now assumes the entire control and care of its insane population. Several others of

the Eastern States have done likewise. These instances will show to the reader the trend of public opinion, an opinion which has been productive of excellent and rapid results in a few States, which is slowly affecting others, and which has failed to make any impression whatever upon those States which still continue the county almshouse and prison management. It is probable, however, that the time is not far distant when all the insane in the United States, except those in private asylums, will be placed exclusively under State control.

To compare the number of insane in any particular State with the number of insane in any other State, giving reasons why a difference of numbers should exist, the population in each State being approximately the same, is exceedingly difficult of accomplishment.

LUNACY LAWS

There are various reasons why this is true:—

First—The laws under which the insane are committed, and which control and direct this department of State government are unlike in most of the different States. The lunacy laws of New York and California place all the insane under State care, with the exception of those in private asylums. The lunacy law of Pennsylvania permits an uncertain number of the insane to be provided for in prisons, jails, and county almshouses. The population of New York in 1890 was 5,497,853, that of Pennsylvania, 5,258,014. Notice the population of each State is nearly the same; still the insane in New York at the close of that year numbered 16,624, while the insane in Pennsylvania at the same date numbered 7611; by this *data* it would seem that New York had 9013 more insane then Pennsylvania, the population of each State being nearly the same. Can this be true? Certainly not. Had the the lunacy laws been the same in each State no such discrepancy would have existed. The facts are, New York reports all its insane; Pennsylvania does not; hence the difficulty of making a just comparison. The above difficulty exists when we endeavor to compare the number of insane in California under State care with any other State where State care does not exist. Comparisons under such circumstances will be invariably detrimental to California or any other State which assumes the entire control of its insane.

RELATIONS OF LARGE SEAPORT CITIES TO INSANITY.

Second—The location of large seaport cities within the confines of a State will make a marked difference in the number of insane that the State will have to care for, and for the reason that such cities contain a large foreign element in their population. This being true, it will be necessary to show that the foreign population as found in this country contributes a large quota of our insane. During the time intervening between October 1, 1880, and September 30, 1895, there were 10,903 insane persons admitted to the New York City Asylums. Of this number 3453 were born in the United States, and the nativity of forty-eight was unknown. The remaining portion of the 10,903, that is, 7402, were foreign born. This clearly shows what an important factor this large seaport city with its foreign population is in estimating the causes which, taken together, contribute to the large number of insane found in the State of New York. What bearing, if any, may the seaport city of San Francisco have upon the number of insane found in California? During the fiscal year commencing July 1, 1895, and ending June 30, 1896, 1145 insane persons were admitted to our State hospitals. Of this number 577 were born in the United States, and the nativity of sixty-six was unknown. The remaining portion of the 1145, that is, 515, were foreign born, and over one third of the total number committed, viz. 346, were received from San Francisco.

The above statement shows how important it is in comparing the insane of one State with that of another, to consider large seaport cities and their population; and all other conditions being equal, those States having large seaports will be burdened with the largest number of these unfortunate people. If further evidence were needed to impress this deplorable state of affairs upon the mind of the reader, I would state that at the present time, May 27, 1897, California is caring for 4789 insane individuals, and of that number 2725 are foreign born. If California was caring for those born in the United States, it would only be burdened with 2064, or less than one half of the number above mentioned. These incompetents, many of them consisting of the scum, riff-raff, and dregs of an over-

crowded European population, are burdening every State hospital for the insane in the United States; but especially those situated in States with large seaports.

The above figures tell their own story as far as California is concerned. This State also constitutes the tramp's and hobo's paradise. For almost twelve months in the year they can roam from one part of the State to another, unkempt and unclean. They usually need no other shelter than the blue canopy of heaven. That which they cannot beg from those more worthy than themselves, they steal; and finally, in not a few instances, find their way into a State hospital for the insane, a burden still to the body politic.

AGRICULTURAL DISTRICTS AS COMPARED WITH CITIES AND THE INSANE.

Third—States with large agricultural districts which furnish healthful out-door employment for a large number of their inhabitants will have fewer insane than States with large and densely populated cities, where thousands are employed in pursuits which are not conducive to physical health, and hence often lead to mental impairment. The trend of modern civilization is toward the massing of a great number of people in our large cities.

"In 1790 only one thirtieth of our country's population lived in cities of over 8000 inhabitants; in 1890 nearly one third. In 1790 there were only six cities in our country with a population of 8000 or more, while in 1890 there were four hundred and forty-eight."*

This condition of affairs, when once known, cannot but attract attention of every thinking man and woman. Just what this means to the commonwealth as a whole, and to each State, morally, intellectually, and socially, will depend upon how these great masses of people live in these large cities. While the wealthy have their sources of dissipation and degeneration, which often lead to insanity, still it is the poverty-stricken to whom we must look for the greater number of the recruits that fill our State hospitals. To substantiate the truthfulness of the preceding statement, I will state that in 1890 there were 91,959 insane persons in the United States; of this number *88,665 were paupers*, of whom 22,961 *were foreign born.*

For the *data* showing how they live in New York City, I am indebted to statements made in the June number of the *Arena*, 1897, by Professor W. I. Hull, Ph. B. Mulberry Bend is known in New York City as "New York's Italy." The name is suggestive of the nativity of the inhabitants. Extending in various directions from the "Bend" are crooked and dark passages, which are lined with towering tenement houses. These are the homes (?) of the masses we are considering. Every race, every land, and almost every nation, tongue, and kindred, are represented here. So great has been the influx of people of other nations into our large cities that some parts seem like foreign lands to our native-born inhabitants. In New York and Philadelphia the foreign-born in the cities at large constitute thirty-four per cent. of the entire population, and in tenement districts they form sixty-two per cent. Those of foreign parentage constitute sixty-nine per cent. of the people at large, while they form ninety-two per cent. of the dwellers in the slums. One district of thirty-two acres in the Eleventh Ward of New York contains 315,008 inhabitants, that is, 986 persons to each acre. Few of the so-called homes have water distributed through the different apartments, hence bathing facilities are limited. Only 306 persons out of 255,033 have had the opportunity to bathe in the houses in which they live. We might continue to dwell upon these sad conditions which are found in these large cities, conditions which are conducive to physical disease, crime, and insanity, but this must suffice. Under this heading, it remains for us to consider the State of California in reference to its agricultural districts and large cities, and determine whether it is subject to like conditions as found in the State of New York, only in a less degree. California has nine cities with a population each of over 10,000 inhabitants. These cities have a population in the aggregate of at least 500,000, and which constitute five twelfths of the population of the State, according to the census of 1890. California has also large holdings of many thousands of acres of land, untilled and practically uninhabited. Much of the land that is under cultivation is tilled in such large bodies, that frequently twenty-five and fifty thousand acres in grain may be found under the control and ownership of one individual. While these conditions remain unchanged, while five twelfths of the entire population are massed in our cities, California will occupy a high rank among the States that are burdened

* *Arena*, June, 1897, Professor W. I. Hull, Ph. B.

with the care of a large number of the insane. Any agency that may be instrumental in placing a portion of our cities' population upon these vacant lands, or that invites the healthful and strong to immigrate to this country to occupy these broad acres, will prove a public benefactor to the people of this State, and at the same time prove to be an important factor in the reduction of our present high rate of insanity as compared with our population.

CALIFORNIA AS A SANITARIUM, AND ITS EFFECT ON INSANITY.

Fourth—A State which has earned a reputation for the excellency of its climate in ameliorating or assisting in the cure of a certain class of diseases is liable to have its insane increase, and for the reason that the importation among its inhabitants of persons who are suffering from disease of any kind, often indirectly paves the way for mental unsoundness. The position taken in the discussion of this part of our subject is to the effect that insanity is only a symptom of a diseased, degenerated, or deranged condition of the body; and that all other conditions being equal, those who are suffering from bodily disease, degeneration, or derangement are more liable to be afflicted with insanity.

California has achieved the reputation of being one of the great health resorts of the world. Individuals suffering from all forms of diseases are coming here in the endeavor to regain their lost health. Many of them have passed the point where medical skill, climatic surroundings, or anything else that may be utilized for the alleviation of human sufferings, can be of any avail. Physicians who should know better advise the removal of hundreds of such invalids to California. But where in California? Any climate, from the frozen North to that of the sunny South, may be found in California; still this State is pointed out as the Italy of America to these unfortunate sufferers, and friends acting under such advice, ignorant of the result and with an anxiety beyond expression, hasten to this supposed cure-all with their sick friends, only, in many instances, to be disappointed. That a properly selected portion of this State, with the climatic influences found in the part selected, will prove of benefit to properly chosen cases, all are willing to admit; but to send such invalids indiscriminately to this State, without giving instructions where or in what locality they shall abide, frequently works a great hardship to the invalid and is manifestly a detriment to the State and its inhabitants.

TUBERCULOSIS.

Many consumptives are coming to California every year. Every such individual is suffering from bodily disease, and as before stated, insanity is only a symptom of bodily disease, degeneration, or derangement, and hence among this class of persons we should expect a high percentage of insanity. It has been estimated by different observers that about fifty per cent. of all deaths in asylums are from tuberculosis, and Schroeder Van der Kolk was of the opinion that "hereditary predisposition to tuberculosis might develop into insanity, and on the other hand, that insanity might predispose to consumption." Be that as it may, several writers on insanity have taken notice of the apparent connection existing between the two conditions, and have considered them to be markedly more than accidental.

Burrows, Ellis, Friedereich, Schroeder Van der Kolk, Skae, Clouston, Biaute, and Ball, have written more or less upon this subject, and have clearly shown that lung diseases, and tuberculosis in particular, have a marked influence on disorders of the mind. While the immediate immigration and presence of these unfortunate people is a menace to the inhabitants of this State, as contributing to the increase of our insane population, still it is to the future that we must look for the most dire results. That tuberculosis is contagious, there can, with our present knowledge of the disease, be scarcely a doubt; and as an evidence that this is so, certain locations on the shore of Southern France once contained a population which could boast of possessing the best of health; but after this beautiful country had become a resort for people suffering from tuberculosis, rapidly the once healthy, and consequently happy, inhabitants became affected by the same disease Through the inherited predisposition to tuberculosis which such persons transmit to their offspring, coupled with the contagion which is ever present in their midst, these people are rapidly becoming a community of invalids. If a halt could be called at once in the further reception of these defectives, if the diseased could be segregated from the healthy,

and if a strict quarantine could be established, it would take generations to undo the evil results that have been introduced among this people in an exceedingly short period of time. The extensive introduction of tuberculosis into this State by those coming here to find relief, has already been felt through its immediate effects in raising the percentage of the insane, but what the future may hold in store for the inhabitants of California, in the way of degeneracy and disease, and which has had its beginning in this kind of immigration, can only be foretold by making a careful examination into the deplorable results following the introduction of tuberculosis into other localities having a reputation for the excellence of their climate.

NARCOMANIA.

This term relates to the excessive use of narcotic drugs, especially opium, or any of its alcoloids, and cocaine, and that its habitual and excessive use has reached such a point that the individual is no longer able, unaided, to control his desire for the drug.

While every State in the Union has its devotees to this ruinous habit, California probably above all other places contains the greatest number. Its use is indulged in by a certain portion of all classes of society, but especially may its slaves be found in the slums of our larger cities. Had the Orientals in their advent in this State deliberately planned to plant a withering curse in the midst of our population, they could not have succeeded better than when they insidiously introduced the opium habit. When once the habit is permanently acquired, it destroys all the ennobling characteristics of the individual, makes him a liar, and usually a vagabond. These degenerates increase the ratio of our insane to the total number of inhabitants. They are entailing, through the laws of heredity, a curse of physical degeneracy, nervous instability, and mental unsoundness upon future generations, the magnitude of which it is impossible to determine.

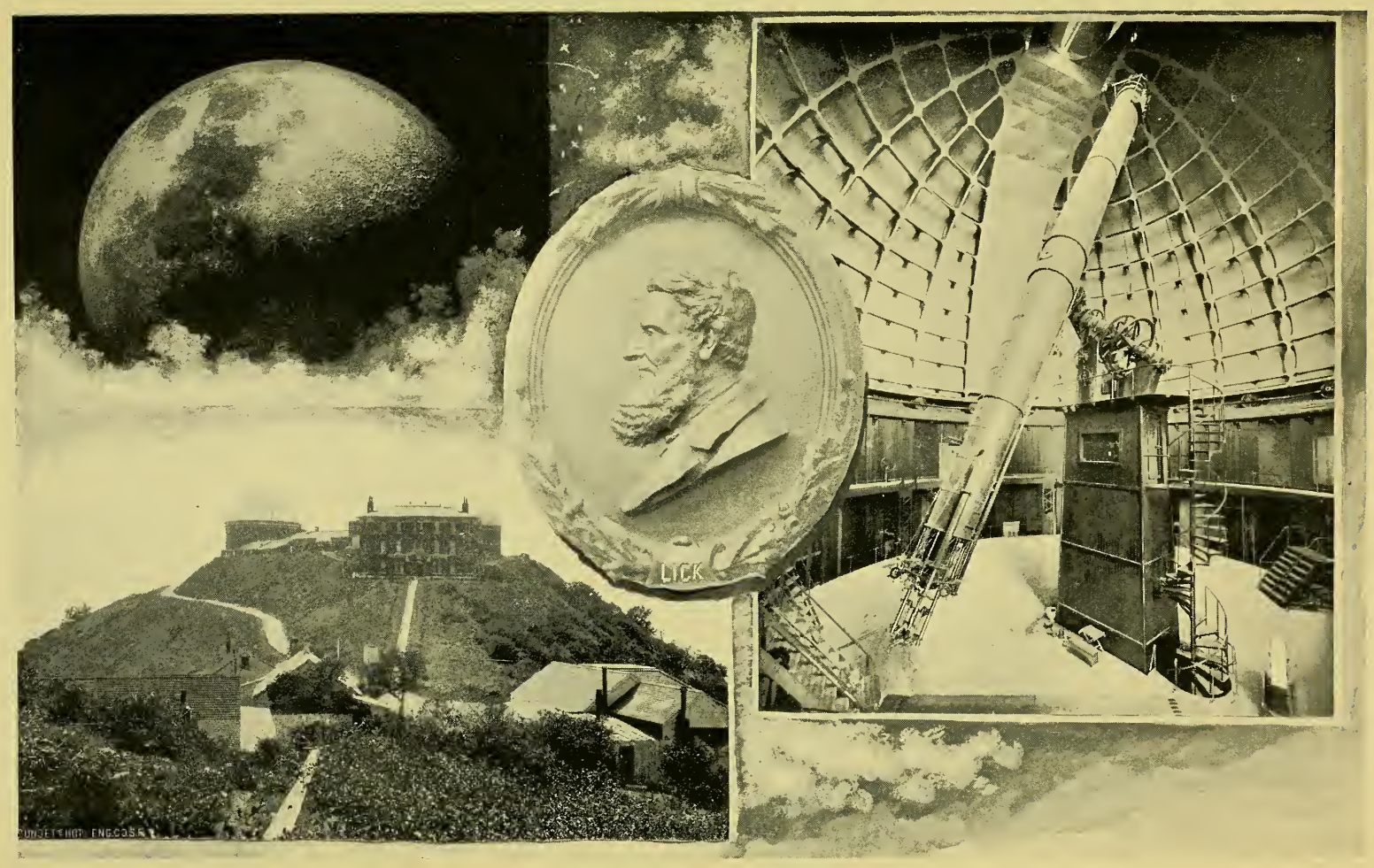
In closing, I would say to the reader who may do me the honor to consider this article, that I have endeavored to point out some of the reasons why California has apparently such a large number of insane when compared with its population. The number of insane, however, that a State may be caring for at any given period is one thing, and the number actually committed during the same period is quite another. Thus, during the year 1886 there was one insane person committed to our State hospitals for every 1259 that were sane; while during the year 1896 there was one insane person committed for every 1251 that were sane. With this showing it is evident that the ratio of the insane committed to the entire population in 1896 was only eight in excess of those committed in 1886.

As long as it appears that insanity is but slightly increasing from decade to decade, as shown by comparing the commitments of 1886 and 1896, and as compared with the increase of population during the same time, the present condition is certainly not one to cause great uneasiness. It is only when the causes of insanity, as discussed in this article, are considered that we may be apprehensive for the future.

I wish now to state most emphatically that in my opinion no individual who is the possessor of health and a good constitution, which health implies, need fear to make California his future home. Such an individual will be in no more danger of becoming insane in this State than in any other, but if through the varying vicissitudes of life such a misfortune should obtain, then in no land upon the face of the earth can he find a more humane and kindlier care and treatment, than will be extended to him by the State of California.

A. M. Gardner.

"The birds 'mid the blossoms unceasingly sing,
In the joy and the gladness which flowers will bring,
That never cease blooming at all."



LICK OBSERVATORY, MOUNT HAMILTON, SANTA CLARA COUNTY.

THE LICK OBSERVATORY OF THE UNIVERSITY OF CALIFORNIA.

By Dr. Edward S. Holden.

JAMES Lick, who gave to the world the Lick Observatory, was born in Fredricksburg, Pennsylvania, on August 25, 1796, and died in San Francisco on October 1, 1876. By a deed of trust, made in 1875, he devoted his whole fortune (aggregating $3,000,000) to public uses. His trustees were directed to expend, for a monument to Francis Scott Key, the author of "The Star Spangled Banner," the sum of $60,000 (this statute is in Golden Gate Park); for statuary emblematic of the history of California, $100,000 (the group is in front of the San Francisco City Hall); for a Home for Old Ladies in San Francisco, $100,000; for free baths in the same city, $150,000; for a manual training school for the boys and girls of San Francisco, $540,000; besides important gifts to the California Academy of Sciences, to the Society of California Pioneers, etc.

The gift by which he will be best remembered, and in a high sense his most useful endowment, is that of the Lick Observatory on Mount Hamilton. To this he gave the sum of $700,000, and he prescribed three conditions: First, that the new observatory should contain the most powerful telescope of the world; second, that the endowment fund should be made "useful in promoting science" (*i. e.* that the observatory should be one of research and discovery), and lastly, that it should be the Lick Astronomical Department of the University of California (the State University).

At the time his gift was made the largest refracting telescope in the world was the twenty-six-inch equatorial of the National Observatory at Washington. It was a matter of doubt whether this could be greatly surpassed, owing to the difficulty of procuring discs of glass of great size. The Lick telescope, mounted in 1887, has a clear aperture of thirty-six inches. From 1887 to 1897 it was by far the most powerful telescope in the world. Its successful construction solved a number of problems, and many other large equatorials have been made and mounted of late years (Chicago, Vienna, St. Petersburg, Paris, Greenwich, Nice, etc.). The Chicago telescope, mounted in May, 1897, is constructed on practically identical plans, by the same makers, and it has a clear opening of forty inches, four inches larger than the Lick telescope.

Great instruments of this class require a serene and quiet air in order that they may do their best work. In this respect the Lick telescope is unrivalled. It stands on the very summit of Mount Hamilton (4209 feet in height) in the Mount Diablo Range, twenty-six miles by road (east) from San Jose. From May till November the days and nights are clear, and during the whole summer the air is quiet; the stars do not twinkle; the highest magnifying powers can be employed. No one of the observatories east of the Sierra Nevada has such advantages; and all large telescopes there situated are more or less handicapped in this regard. The Lick Observatory was one of the very first "mountain" observatories to be constructed, and here, again, it has been the parent and exemplar of a large number of such establishments founded in late years. All the problems presented by snch a situation have been successfully solved here, and life is as thoroughly organized at Mount Hamilton as in a city. It should be remembered that the little community at the summit has every want that the largest city can feel. It must have good roads, light, power, heat, food, water, shelter, workshops, libraries, besides its special apparatus and appliances. It is, in short, a little astronomical city, placed on the summit of a mountain, and devoted to one special aim—the increase of our knowledge of the stars.

The Lick Observatory has assumed another function of importance in addition, namely, the diffusion of such knowledge in the community. On every Saturday night, from seven o'clock, its doors are thrown open to the public, and all are encouraged to come to see for themselves, through the telescopes the planets and stars of which they may have read. On every week-day, also, the stages bring visitors who remain for an hour or more, who are shown through the buildings, and to whom the workings of the apparatus are explained. More than 50,000 persons have visited Mount Hamliton since it

was opened for work, and every one of them has gone away with a clearer idea of the objects and methods of modern science.

The regulations established by the Regents of the University for visitors are as follows:—

"Visitors will be received at the Lick Observatory during office hours, whenever any of the astronomers are present.

"Regular nights in each month, not exceeding one per week, shall be set apart for the reception of visitors, except during inclement weather, and visitors will be received on these nights between certain hours, and at no other times.

"The observatory buildings will be open to visitors during office hours, every day in the year. Upon their arrival visitors will please go at once to the visitors' room and register their names.

"An hour or so can be profitably occupied in viewing the different instruments, and the rest of the stay can be well spent in walks to the various reservoirs, from which magnificent views of the surrounding country can be had. At least an hour and a half of daylight should be allowed for the drive from the Summit to Smith Creek. There are no hotel accommodations at the Summit.

"For the present visitors will be received at the observatory to look through the great telescope, every Saturday night, between the hours of seven and ten, and at these times only.

"Whenever the work of the observatory will allow, other telescopes will also be put at the disposition of visitors on Saturdays, between the same hours (only).

"At ten P M. the observatory will be closed to visitors, who should provide their own conveyance to Smith Creek, as there is no way of lodging them on the mountain."

The Lick Observatory is, by Mr. Lick's deed, a department of the State University. As such, it has always encouraged the presence of students of mature age, who are received on the footing of assistants. When suitable provision is made for Fellowships in Astronomy the observatory will be able to attract the best students of the whole country. Undergraduate students are given a thorough course of instruction at the Students' observatory, Berkeley.

Mr. Lick, in August, 1875, selected Mount Hamilton, in Santa Clara County, as a site for the observatory. Land for the site (1350 acres) was granted by Act of Congress June 7, 1876; 149 acres additional were purchased by Mr. Lick. The north half of section sixteen of the township was granted to the University, for the use of the observatory, by the Legislature of California in 1888. This land (320 acres) is continuous with the grant from the United States. Congress also granted, in 1892, an additional tract of 680 acres, making the total area of the reservation about 2581 acres. A road to the summit of Mount Hamilton, 4209 feet above the sea, was built by Santa Clara County, at a cost of about $78,000, in the year 1876.

It is hoped that the State will establish a forestry station on section sixteen, above mentioned.

The observatory buildings are very simple, solid, and well suited to their uses. The great thirty-six inch refractor is unsurpassed in excellence. The gift of a three-foot reflector, one of the largest and finest in the world, by Edward Crossley, lately M. P. for Halifax, England, has added a companion telescope of almost equal power. It is not likely that any observatory now planned will have an equipment more effective than that of the Lick Observatory in its admirable situation.

Other smaller instruments are provided, each suited to its especial work. Among them may be named:—

The twelve-inch equatorial (used for the observation of the positions of comets, the measurement of double stars, etc., etc.).

The six and a half-inch meridian circle (used to determine the positions of stars and planets).

The six and a half-inch comet-seeker (used for the discovery of comets, etc. Fourteen comets have been discovered at Mount Hamilton since 1888).

The five-inch photo-heliograph (used to make daily photographs of the sun and sun-spots).

The five-inch Crocker telescopes (a pair of effective photographic portrait lenses used to make photographs of comets, nebulæ, the Milky Way, etc.).

The five-inch Floyd equatorial (used to photograph and also to observe with the eye).

The four-inch transit instrument (used to determine time, latitude, etc.).

These instrumentss require a large number of subsidiary pieces of apparatus—a few of which may be mentioned:—

The Mills spectroscope (used with the great telescope to photograph the spectra of stars).

The Bruce spectroscope (to be used with the Crossley reflector for the same purpose).

The Bruce photometers (to be used with the equatorials to measure the brightness of the stars).

The seismonmeters (to record the circumstances of earthquake shocks and tremors).

Many of these pieces of apparatus have been presented by friends of the observatory—Messrs. D. O. Mills, C. F. Crocker, Edward Crossley, Miss Catherine Wolfe Bruce, Miss Floyd, and others.

The instruments of the Observatory have cost about $112,000; its buildings, etc., some $498,000. The total cost of the establishment (up to 1888) was $610,000. The balance of Mr. Lick's gift, $90,000, is invested as an endowment fund. The interest on this sum is entirely inadequate for the support of the institution, and the deficiency is made up, so far as is practicable, from the University income. The Lick Observatory is magnificently equipped but it is insufficiently endowed. Its chief wants are the establishment of a number of Fellowships in Astronomy, and the provision of a special library fund. In our isolated situation the need of a large professional library is sorely felt. There is, at present, no means to publish the observations which have been amassed.

It is quite impossible in the present place, to speak of the scientific work of the Observatory in any detailed way. During the nine years of its existence the Observatory has taken a foremost place among the great observatories of the world. Although its income is scarcely a third of that of the great observatories of Greenwich, Paris, and St. Petersburg, and although its scientific staff has never consisted of more than eight persons as against thiry to fifty observers in those establishments, yet its activity has been extended over many fields and its researches in each field have been scholarly and thorough, and its discoveries of high interest and value.

Through the generosity of a friend of the Observatory, Mr. W. W. Law of New York City, the publication of a large map of the Moon in some sixty sheets, from negatives taken with the great telescope, is now in progress. Other photographic plates of the Milky Way, Comets, etc., are to be issued also.

The regular publications of the Observatory are usually technical in character and are not for general distribution. We are often asked how those interested in Astronomy who are not professionals, can keep themselves informed of the progress of the Science at Mount Hamilton and elsewhere. This may very well be done by joining the Astronomical Society of the Pacific and receiving its journal.

Each issue of the publications of the Astronomical Society of the Pacific contains Notices from the Lick Observatory, which are brief accounts of the scientific work of the institution, prepared by the astronomers. Especial pains are taken to put these accounts into a simple and popular form. The history of the Observatory can be followed from month to month in these publications.

The foregoing very brief account will give an idea of the present state and work of the Lick Observatory. All of it is the outcome of the gift of Mr. Lick to the citizens of his adopted State. Of all his gifts his Observatory was undoubtedly nearest to his heart, and it will do more than any other to preserve his memory.

I think that if he were living he would be satisfied with the result. No effort has been spared on the part of each person connected with the Observatory—Trustees, Regents, astronomers, employees—to carry out its objects faithfully and well, and to make it the first observatory of the world.

E. S. Holden

THE TIDAL RESERVOIR OF THE GOLDEN GATE.

SAN FRANCISCO.

By Edwin H. Clough.

THE GOLDEN GATE.

The air is chill, and the day grows late,
And the clouds come in through the Golden Gate;
Phantom fleets they seem to me, from a shoreless and unsounded sea;
Their shadowy spars and misty sails,
Unshattered, have weathered a thousand gales:
Slow wheeling, lo! in squadrons gray,
They part, and hasten along the bay,
Each to its anchorage finding way.
Where the hills of Sausalito swell,
Many in gloom may shelter well;
And others—behold!—unchallenged pass
By the silent guns of Alcatraz;
No greetings of thunder and flame exchange
The armèd isle and the cruisers strange.
Their meteor flags, so widely blown,
Were blazoned in a land unknown;
So, charmed from war, or wind, or tide,
Along the quiet wave they glide.

What bear these ships? what news, what freight
Do they bring us through the Golden Gate?

The air is chill, and the day grows late,
And the clouds come in through the Golden Gate,
Freighted with sorrow, heavy with woe;
But these shapes that cluster, dark and low,
To-morrow shall be all aglow!
In the blaze of the coming morn these mists,
Whose weight my heart in vain resists,
Will brighten and shine and soar to heaven
In thin, white robes, like souls forgiven;
For heaven is kind, and everything,
As well as a winter, has a spring.
So, praise to God! who brings the day,
That shines our regrets and fears away;
For the blessed morn I can watch and wait,
While the clouds come in through the Golden Gate. —*Edward Pollock.*

THE importance of a seaport in its relations with the commerce of the world is indicated by the registered tonnage entered at its Custom House. During 1896 the net tonnage entered at the San Francisco Custom House, from foreign and Atlantic ports, was 1,380,787 tons; the movement outward aggregated 1,299,722 tons. This tonnage was carried by 963 vessels, of which 625 were sail and 338 steam. The sailing vessels carried 768,187 tons, and the steam craft carried 612,580 tons. The total

sail tonnage, arrivals and departures combined, was 1,451,790 tons, and 1,219,699 tons steam tonnage, the number of vessels being 1199 sailing and 699 steamers.

During the year the flag of every nation on earth fluttered in the winds that ruffle the surface of San Francisco's landlocked bay. Clippers, Clyde-built, from the docks of Liverpool; "lime-juicers," jute-laden, many days out from Calcutta; sturdy, old-fashioned packets from Hamburg; "long, low, rakish" craft from the Mediterranean; brigs and barkentines, built on queer lines and manned by queer little brown men of Japan; barnacled hulks from Java, their holds stowed with coffee; swift schooner-rigged traders from the south seas; coastwise tramps, familiar with every port of the Pacific littoral, from Valparaiso to Sitka; colliers from Australia and British Columbia; whalers from the frozen north; merchantmen from the tropic south; tea caddies from Shanghai; and reformed pirates from Rangoon — all these anchored in the stream, discharging merchandise valued at $36,414,862.

The exports of merchandise by sea to foreign ports from San Francisco during 1896 amounted to $40,433,745, and the value of shipments to New York and other Atlantic ports added $3,080,251 more, making a total export record of $43,513,996. This total was $10,249,135 more than was credited to 1895.

The treasure shipments from San Francisco by sea during 1896 aggregated $15,510,829, and by rail, $15,233,997, a total export amounting to $30,744,826. The sea shipments of treasure were destined for Hongkong ($6,413,174); Shanghai ($4,587,521); Bombay ($35,000); Japan ($3,003,071); Honolulu ($1,112,370); Central America ($285,025); Mexico ($19,266); Singapore ($50,000); Tahiti ($4,752); Fanning Island ($500); Samoa ($150). The character of these shipments included silver bullion, $5,909,008, Mexican dollars, $8,212,386; gold coin, $1,133,901; silver coin, $97,991; gold dust, $4,656; nickels, $1,900; currency, $415; Chilian dollars, $7,027; Peruvian dollars, $143,350; gold bullion, $195.

The poets have never given us accurate figures concerning "the wealth of Ormus or of Ind," and it is therefore safe to assert that the following tabulated statement of treasure shipments from the port of San Francisco will compare opulently with similar export from the vague regions of Ophir and Golconda:—

1885	$18,804,749	1892	$14,576,578
1886	18,209,881	1893	13,052,942
1887	15,413,807	1894	13,978,869
1888	16,547,230	1895	18,799,671
1889	20,265,857	1896	15,510,829
1890	8,667,380		
1891	9,074,306	Total	$181,902,099

The combined exports, treasure and merchandise, exclusive of merchandise by overland railroads, during the past three years were as follows:—

Values.	1896.	1895.	1894.
Merchandise	$43,513,996	$33 264,861	$26,410,672
Treasure	30,744,826	35,953,094	22,650,449
Totals	$74,258,822	$69,217,955	$49,061,121
Increase in 1896	5,040,867	.....	.....

The treasure shipment of 1896 includes $15,233,997 overland by express, $6,585,861 of which was in coin, $42,461 in bullion, and $8,605,675 in currency.

During the same years the combined values of imports of merchandise and treasure from foreign countries were as follows:—

Values.	1896.	1895.	1894.
Merchandise	$36,414,862	$38,925,607	$38,514,686
Treasure	11,864,424	3,434,297	3,572,418
Totals	$48,279,286	$42,359,904	$42,087,104

The commercial status of this metropolis is emphasized by the reports of the Clearing House, which, for 1896, showed transactions amounting to $683,229,599. These figures in comparison with $692,079,240 clearings for 1895, are the business man's visible evidence of the universal stringency. But there were many "years of unexampled prosperity"

for San Francisco before the "shrinkage," as may be adduced from the fact that since the date of organization of the Clearing House, March, 1876, the total clearings amounted to $3,159,528,975. The largest amount in this record was for the year 1891, when the clearings aggregated $892,426,713.

THE GOLDEN GATE.

It has always been a source of wonderment to the student of local history that Sir Francis Drake, eminent buccaneer and forthright freebooter, should have sailed past the Golden Gate, imagining that he was following the trend of an unbroken coast. That the pillaging explorer anchored his "Golden Hind" in the open roadstead that has since borne his name, and remained there nearly two months without knowledge that one of the finest harbors in the world lay on the other side of the range of hills to leeward of his vessel, only increases the wonderment of those who have never approached the Californian coast from the sea. Navigators, however, are not surprised that Drake missed the harbor entrance and they will aver that the discovery of the bay of San Francisco from the landward, as it was discovered by Portala, was more probable than the chance of a sailor to observe an opening in the coast only two and one half miles wide at the entrance of a narrow channel four miles long.

The outer entrance of the harbor is designated by a line drawn between Point Lobos on the south and Point Bonita on the north, the one being the northwestern extremity of the peninsula of San Francisco, and the other marking the southwestern coast of Marin County. Fort Point and Lime Point, headlands on either shore of the channel, which narrows here to a distance of one and one eighth miles, form the eastern port of what may be termed the vestibule of the Golden Gate. Westward from the outer entrance is the bar of the harbor. From Point Lobos to the western arc of this bar is a distance of six miles. From the foot of Market street to the Golden Gate, between Point Bonita and Point Lobos, is eight miles, and a ship outward bound from the port of San Francisco sails fourteen miles before she crosses the bar and dismisses her pilot. The depth of water on the bar is five and one half fathoms. Between Fort Point and Lime Point, eight miles eastward from the bar, the depth is sixty-five fathoms. One mile westward from this chasm the soundings show thirty-two fathoms, and one mile eastward the ocean floor is forty fathoms at low water. If Telegraph Hill were dumped into this hole, it would not impede navigation, for there would still be twenty-four fathoms of water between the top of the hill and the surface of the channel. And it would require a fifteen fathom line to catch rock-cod lurking in the dome of the Spreckels building, if that aspiring structure were deposited in the Golden Gate at this point. Here the natural order is reversed, and the tide flows with greater velocity on the bottom of the channel than it does at the surface. If this water were precipitated from a similar altitude, and in similar quantity over a terrestrial cliff, it would outroar Niagara.

THE HARBOR.

From tide water at Alviso, the southern extremity of San Francisco Bay, to the mouth of the Sacramento River, where that stream empties into Suisun Bay, through a navigable channel, the linear distance is eighty-three miles. This distance may be best exemplified for descriptive purposes in the following manner:—

From the foot of Market street south to Alviso	35 miles.
From the foot of Market street north to San Pablo Bay	13 miles.
(Between Point San Pedro and Point San Pablo.)	
From San Pablo Bay north to the Straits of Carquinez	12 miles.
(To a point opposite Mare Island.)	
From Carquinez Straits to the entrance of Suisun Bay	7 miles.
(Between Army Point and Suisun Point.)	
From Suisun Bay to the Sacramento and San Joaquin Rivers	16 miles.
Length of Bay, with tributaries	83 miles.
Width of Bay between Baden and the eastern shore	12¾ miles.
Width of lower Bay between Point Avesadero (Hunter's Point) and the Alameda shore	5¾ miles.

Width of the Bay from foot of Market street to Oakland shore (Ferry route). 4¾ miles.
Width of San Pablo Bay—a circle swinging to the northward from Point Pinole would inscribe an arc with a radius of ..... 8 miles.
Width of Suisun Bay from Grizzly Point to the north shore ..... 6½ miles.
From Point Pinole across clear water (San Pablo Bay) to Petaluma Point..... 9½ miles.
From the foot of Market street to Benicia..... 30 miles.
(Head of navigation for deep-water vessels.)
From the foot of Market street to Vallejo ..... 28 miles.
(Opposite Mare Island Navy Yard.)

Air-line distances.—From the foot of Market street to the summit of Mt. Diablo (altitude 3700 feet), due east, in Contra Costa County, 26½ miles. From the foot of Market street to the summit of Mt. Tamalpais (altitude 2592 feet), northwest, in Marin County, 14 miles. From the foot of Market street to the summit of Mt. Montara (altitude 2000 feet), in San Mateo County, 17 miles.

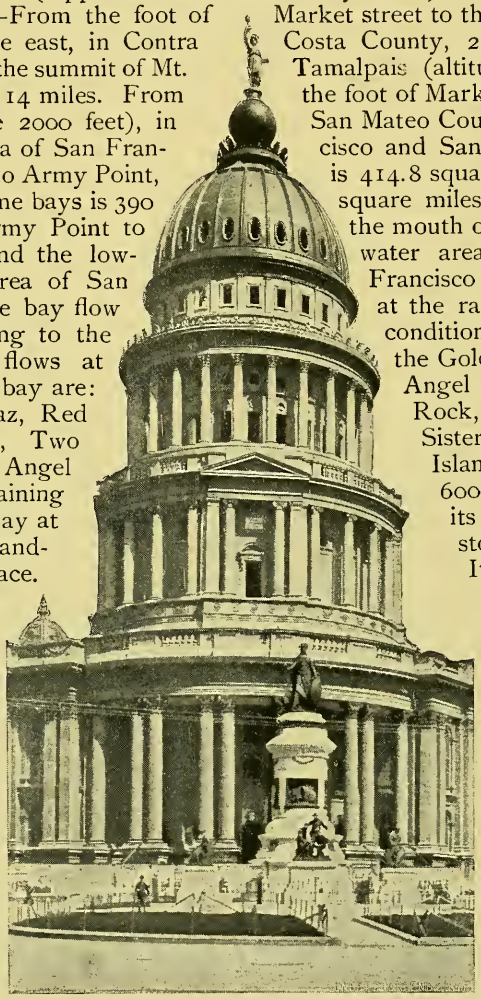
The high-water area of San Francisco and San Pablo Bays, including the Straits of Carquinez to Army Point, is 414.8 square (statute) miles. The low-water area of the same bays is 390 square miles. The high-water area of Suisun Bay from Army Point to the mouth of the Sacramento River is 49.9 square miles, and the low-water area is 41 square miles. The mean tide-water area of San Francisco Bay is 448 square miles.

The currents of the bay flow at the rate of from one to four knots an hour, according to the condition of the tide; and the strongest tide always flows at the Golden Gate.

The islands of the bay are: Angel Island, Goat Island (Yerba Buena), Alcatraz, Red Rock, Brooks Island, Marin Islands, Two Brothers, Two Sisters, and Mare Island. The largest of these is Angel Island, three miles north of San Francisco, and containing 600 acres. It is 760 feet above the level of the Bay at its highest point, and quaries of blue and brown sandstone have been partially developed upon its surface. It is a military post, and is the quarantine station for the port.

Goat Island is a conspicuous landmark, three miles east of the city, 340 feet high, and containing about 300 acres. The government has established a lighthouse outfitting station, a torpedo station, and magazine on the island.

Alcatraz is a fortified station, about one mile north of the city, containing thirty acres, at an elevation of 140 feet above low water. The island is also a prison for refractory soldiers of the United States army. The light on this island can be seen nineteen miles at sea.



DOME OF CITY HALL, SAN FRANCISCO.

San Francisco, for lack of a more appropriate personification, may be likened to a beautiful woman gazing seaward from the shelter of a pavilion of purple and gold, the tapestried walls of which are shot with "old romance." At her feet throbs sixty-eight million miles of ocean, from shore to shore of two continents; within the sweep of her arm lies the fairest region on the face of the earth. She arose like an exhalation from the reek of contending civilizations; and when the gold-seeking Saxon had displaced the pastoral Latin, she was enthroned proudly on her seven hills, a queen of cities.

So much for the poesy of the metropolitan environment. Thenceforth Satire sings in degenerate dithyrambs of "skirts bedraggled in the mire of politics"; of "looting greed ravishing fairest jewels from the bosom of this 'queen of cities'"; of "reckless waste and taxes high, to sate the voracity of the municipal contractor and the official feeding ravenously at the public crib." All of which is but cynic expression in protest of the fact that

the people of San Francisco were paying, in 1896, a tax amounting to $1.56½ for the support of their city and county government, which, in addition to the State tax of 68½ cents, compelled the payment of $2.25 for the privilege of owning $100 worth of property in this community. It was contended, with querulous insistence, that even "the glorious climate" and "the material advantages resulting from a Californian citizenship" did not compensate for the labor of bearing the burden of that citizenship imposed by tax-eating officials and the contractor, who goeth about seeking what he may devour.

There were optimistic dreamers arguing for civic reform and an economical administration of the city government, who asserted that one dollar levied on each $100 worth of assessable property was amply sufficient for all necessary municipal purposes. But the tax-eater laughed such argument to the scorn it deserved, and asked with bitter contempt of the taxpayer's plea, how it would be possible for a city assessed on property valued at $357,586,126 to avoid an "estimated expenditure" of at least $5,315,580, balancing his "estimate" with $3.861,000 to be derived from taxation and $1,454,580 from other sources.

However, the "dreamer's" voice prevailed, for it began to cry out menacingly, and the taxeater was finally forced to levy a tax of only 96.92 on each $100 valuation, which, added to the State tax of 42.9 cents, made a total levy of $1.3982.

It is necessary that the stranger within the Golden Gate should be informed of the truth concerning our municipal affairs, to the end that he may not accuse us of inducing him, by false pretense, to take up his abode with us. It is well that the stranger aforesaid should know the evils that beset the community as well as the benefits we derive from natural and acquired advantages, and the profit we count upon in the proper manipulation of those advantages.

It is only half the story to tell of a tax rate reasonable enough to satisfy any ordinary "civic reformer." The sequel is contained in the fact that while the taxpayer slept peacefully, undisturbed by haunting visions of enormous tax bills, the taxeater continued to gnaw greedily upon the municipal bone. The taxes had been reduced—true, but the expense of maintaining the city government had not receded. And now comes the Finance Committee of the Board of Supervisors bewailing a "shortage." Especially "short" is the General Fund—nearly $100,000—and while the School Department had about $40,000 surplus in its fund at the beginning of the fiscal year, it is now asserted that the apportionment was not adequate, and that there are claims against the department for "back salaries" amounting to $115,500. Mayor Phelan, at a recent meeting of the Finance Committee, hinted at the size of the municipal bung-hole, when he suggested that many of the employees of the various departments might be dispensed with, directing specific attention to the methods of the County Clerk, and those of his deputies who do nothing aside from drawing their salaries, conditions antagonistic to the Clerk's express pledge to conduct his office at a monthly expense of not more than $6000.

It is regarded as a species of treason to offer adverse criticism of the public schools and the methods of their management. Under the *ægis* of the public school system, grandiloquently designated "the palladium of our liberties," many a fraud is perpetrated upon the citizen of the Republic. It is a demonstrated fact that the citizen of the Republic will pay, without a murmur, enormous sums to support the national system of education, when he would protest to the verge of riot if alled upon to give similar amounts for the maintenance of any other branch of the government. He considers it his highest and most patriotic duty to strengthen, by every means in his power, the foundations of the structure that he has erected for the mental, moral, and physical betterment of his children, and it is upon this sentiment that the designing schemer occasionally works for his personal profit—it is upon the presumption that the citizen will continue to submit to extortion on behalf of his beloved school system that the baser elements of local politics advantage themselves.

The latest school census for San Francisco enumerated 74,840 children of school age in the city. Of this number, it was found 18,427 did not attend any school. The parochial schools of the Catholic Church absorbed 6491 and other schools contained about 2000 more, leaving during 1897-8, a public school enrollment of about 47,000. To teach these children the School Department is asking the people to pay $1,466,458.87, $962,080 of which is scheduled as teachers' salaries; $115.500, teachers' unpaid salaries, and $334,453.15, supplies, books, stationery, and repairs. In addition, the Board of

Education asks for $550,000 for "permanent improvements." In other words, it is advised by the San Francisco Board of Education that a tax per capita of $27.01 be levied for public education, based upon the total enumeration of children in the city; or $43 a year for the education of each child enrolled in the public schools. Without considering the fact that the people are suffering for lack of sufficient money to meet other expenses of living, and merely adducing the circumstance that the per capita expense of educating the enrolled pupils of the public schools of this city during 1896 was only $26.41, the fiscal absurdity of this proposition by the Board of Education looms as grotesque and incongruous as a jest at a funeral. It is only mentioned as an example of fine humor on the part of the educational junta of a big city.

The following table will show how liberal San Francisco has been in the matter of public school education during the past ten years:—

Fiscal Year.	Appropriation.	Enrollment.	Fiscal Year.	Appropriation.	Enrollment.
1886–7	$ 781,400	43,311	1892–3	$1,099,400	45,775
1887–8	909,400	42,330	1893–4	1,009,400	44,349
1888–9	919,400	42,626	1894–5	1,008,460	44,822
1889–90	997,930	42,926	1895–6	1,009,480	45,435
1890–1	1,070,900	43,626			
1891–2	1,075,641	46,172	Total	$9,881,411	

The teachers of San Francisco are better paid than those of any other city in the United States. The average salary of men teachers in the primary and grammar grades is $141.39 a month; and in the high schools, $157.08. The women teachers of the primary and grammar grades average $79.05 a month, and those teaching in the high schools receive $113.50.

San Franciscans are proud of their Park. They delight to impress the stranger with the statistics of its dimensions and the magnitude of the labor that was requisite to reclaim its shifting sand dunes and compel the arid soil to furnish rich sustenance for arboreal products of every clime in the world. It is a congenial pastime to chaperon the visitor from the frozen East in the months of December or January through these valleys fragrant with the scent of roses as fresh as any that grew when "the gardens of Gul" were in bloom; across acres of lawn, into the shadow of trees that perish outside of conservatories in other lands, along slopes where the wild deer browses and the buffalo munches his cud in bovine meditation, fancy free, past the aviary where the birds are twittering and caroling and where the gray squirrel chirps to the chipmunk; finally taking the wonder-stricken traveler to a high place called Strawberry Hill, there to feast his eyes on a prospect that cannot be equaled at that season in any zone the world about.

It seems a profanation almost, to utter measurements and distances in the presence of all this beauty, but it is deemed a part of the *cicerone's* duty to inform the stranger that the Park is three miles in length by the main drive to the ocean beach, and half a mile wide, and that it contains 1013 acres. And it would certainly be regarded as a sordid reflection upon the result of all this planning, development, laboring, and waiting, to be compelled to inform the stranger that this superb pleasure ground cost the people last year $302,146.80. It would be inadvisable, also, to mention this generous expenditure in the hearing of experts familiar with the cost of maintaining parks in other cities, for they might dampen the esthetic ardor of the native by declaring that climate had much to do with the success of gardening in California, and that $100,000 a year, or $150,000 at most, ought to be ample taxation at this stage of the development and growth of Golden Gate Park. They might argue that $193,100.55 was too much to charge to the construction account, and that $103,346.25 was an excessive amount for maintenance. But such criticism would be hotly resented by the loyal Californian who loves to pay liberally for a "public utility," that in private possession would cost the owner but half the price the tax-burdened citizen pays.

These are salient features of preventable extravagances. It must be confessed that not all of the civic *régime* open to criticism has been alluded to, but enough has been recited to indicate that we of San Francisco are neither better nor worse than cities of the same class the world over. We are still struggling with the problem of municipal government in an incipient stage of development, and it is claimed that we are woefully handicapped in the effort to better our condition by the lack of a charter intelligently framed to meet the exigencies of the occasion. There is a constant agitation in the direction of a

more compact and efficient administration; and eventually, when public opinion has grown sturdier, and our experience has ripened our judgment, perhaps we shall be able to make a better showing.

Another phase of San Francisco's generous regard for the needy is exemplified in her care of the poor who are always with us, the weak, the helpless, the unfortunate, and the incompetent. It is estimated that the people of this city expend more than $2,000,000 a year in charity. A community that puts its hand in its pocket to that extent on behalf of suffering humanity is not wholly bad, and it would necessitate the maintenance of a wider area of Tenderloin and a broader extent of Barbary Coast than San Francisco now possesses to offset the good that is being accomplished by our Associated Charities, our kindergartens, our church organizations, our benevolent orders and societies, our public relief institutions, and our private alms-giving. As Uncle Toby's oath was blotted by the tears of the Recording Angel in the Chancery of Heaven, so, many of our sins of omission and commission may be palliated in the Court of Final Appeal by the mitigating circumstance that we have "done unto the least of these" that which the first Christian said was vicarious hospitality to himself.

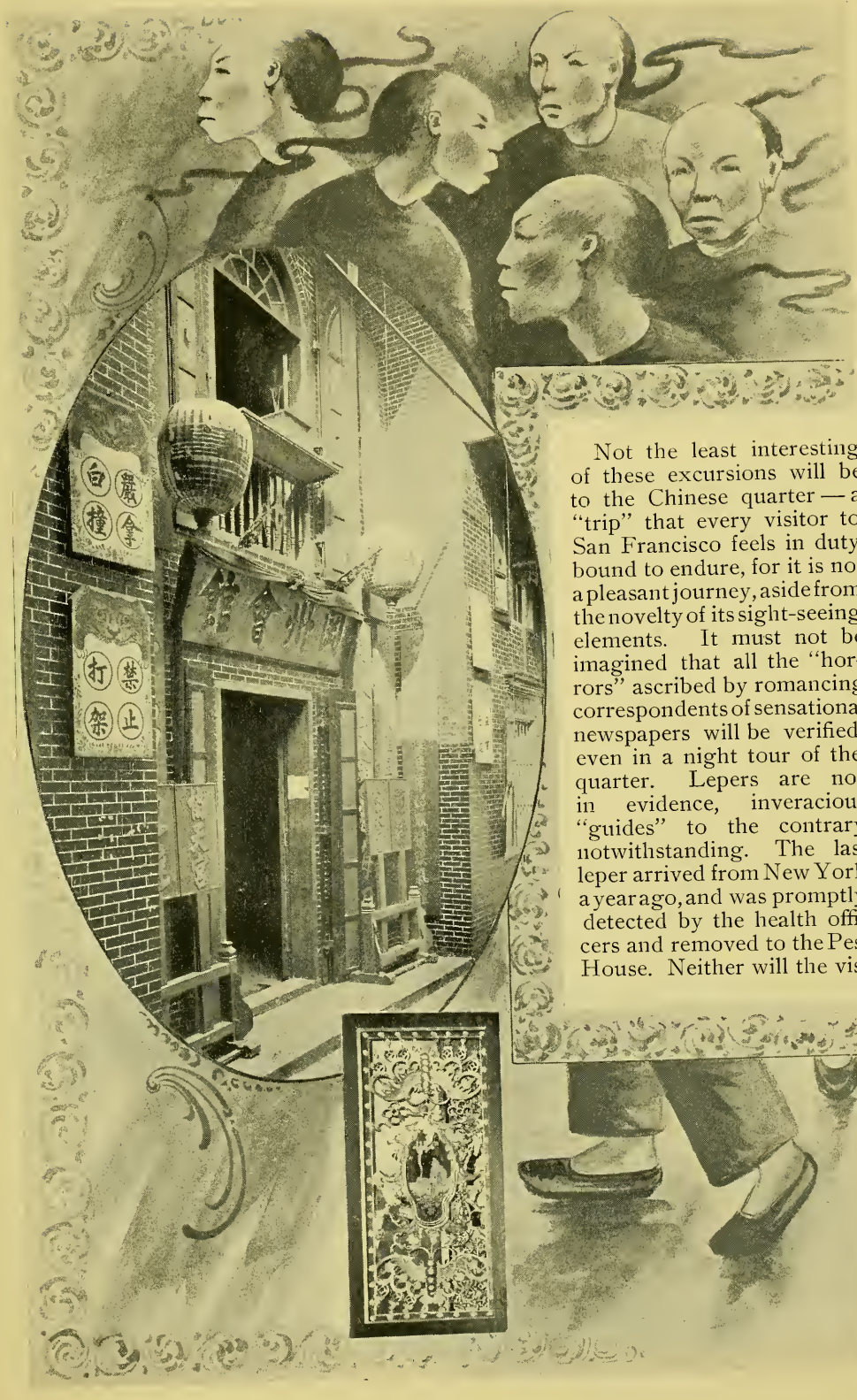
San Francisco is well provided with the equipment of a social civilization. We are not yet acutely cognizant of caste distinctions, and we have not classified ourselves into aristocracies and proletariats, but we tolerate a "four hundred," and we speak of the region south of Market street as the people of New York refer to the East Side and Cherry Hill. The mass of the community, however, averages with that of other cities in dignity and self-respect, and they go about their affairs of business and pleasure in democratic disregard of mouldy grandsires and griffen-crested or drawn-and-quartered ancestry. Our clubs are not so exclusive that a gentleman who can pay his initiation and monthly dues may fear an excess of blackballs or rejection by the governors. Other organizations are hospitable to congenial spirits of every degree, provided, of course, that the applicant is a fit associate in common life.

The women of San Francisco are the dominating element of society, as they are in every civilized community; and they are as aggressive as women of other cities in the promulgation of "doctrines," the "advancement" of "ideas," the advocacy of theories (practical and Utopian), and earnest effort to render the conditions better and the common understanding wiser than they found it.

San Francisco is a cosmopolitan city, and its moral tone cannot be justly gauged by the standard of a New England village or a city whose population traces its majority of ancestry back to the Puritan invasion. This cosmopolitanism will account, in a great measure, for the fact that the city derives a license revenue from the sale of liquor in 13,000 places of public resort, classified as saloons, groceries, theaters, and restaurants, netting a revenue to the commonwealth of $273,000 a year. The fact that San Francisco is a seaport on the verge of the world is another reason why the vicious element and vicious tendencies are somewhat prominent. A floating population of the class that comes to San Francisco is not hampered by exalted ideas of what constitutes strictly moral conduct. A watchful and efficient police, however, is our safeguard from this element, and actual crime is less prevalent here than in other cities contiguous to the highways of the world.

San Francisco is a picturesque city. Its architecture is a novelty and a spectacle for the stranger, until he realizes that the habitations were built to fit the mild climate by a people who love the sunshine and begrudge the necessity of walling themselves in. As a consequence, the "bay window" is a feature of the residence streets, and the fronts of the majority of houses are without ornamentation to intercept the sunlight. The streets are not as well paved as they might be, but since the merchants insisted that they should be kept clean at a minimum of expense, the afternoon winds that prevail in the summer are not so disagreeably dusty as they were when the contractor "bossed the job."

The visitor to San Francisco will never tire of the magnificent distances that stretch away from the summits of the hills. He will thoroughly enjoy the ride on the cable lines that carry him to these outlooks, and he will appreciate the system that gives him a transfer to every conceivable point of interest in the city. He can ride from the foot of Market street to the ocean beach for a nickel if he does not elect to spend an hour in the Park *en route*. Or if he prefers to travel in the same direction by electricity he will find ready accommodation within easy distance of the central section of the city. On all these lines picturesque views may be secured and curious quarters of the town visited.



Not the least interesting of these excursions will be to the Chinese quarter — a "trip" that every visitor to San Francisco feels in duty bound to endure, for it is not a pleasant journey, aside from the novelty of its sight-seeing elements. It must not be imagined that all the "horrors" ascribed by romancing correspondents of sensational newspapers will be verified, even in a night tour of the quarter. Lepers are not in evidence, inveracious "guides" to the contrary notwithstanding. The last leper arrived from New York a year ago, and was promptly detected by the health officers and removed to the Pest House. Neither will the vis-

itor be piloted through "underground labyrinths, reeking with filth and unspeakable odors." Cellars there are, noisome and odorous enough, but of "labyrinths" and "underground cities" there are none. These exist only in the "graphic accounts" of the imaginative newspaper men. There are 20,000 Chinamen in the district bounded by California, Pacific, Kearny, and Stockton streets, and it is safe to assume that 19,000 of these smoke opium. They smoke opium as the white man smokes tobacco, and every house is an "opium joint;" but the "tourist" will not find "hordes of white boys and girls in these dens hitting the pipe," as the same correspondent who imagined the "labyrinths" has depicted. The laws of California cannot prevent the smoking of opium in the smoker's house or lodging; but if he permits others to smoke there the law construes the action as a violation of the ordinance prohibiting "the sale or giving away" of the drug "to be smoked on the premises," and punishes the violator by the fine or imprisonment prescribed as the penalty for misdemeanor. In consequence, the Chinese will not permit white men, boys, or girls to smoke in their houses.

But if lepers and depraved whites are not among the "attractions" of the Chinese quarter of San Francisco, there is still much to be seen that will amply repay the curiosity of the stranger seasoned to the "slums" of Eastern cities. The temples, or "joss houses," the restaurants, the curio shops, the markets, the alleys, the lodging houses, the theaters, the missions, and the queer crannies of the district, are all interesting to people not familiar with them. It is certainly all very picturesque, but it is also very dirty, and one visit generally suffices.

Besides the Chinese district there are other quaint sections of San Francisco, not so disagreeable. The Latin Quarter, skirting the southern and western slopes of Telegraph Hill, is replete with suggestion of the Levant and the Riviera—the mingling of Greek, Neapolitan, Syrian, Turk, Slavonian, and exiles from Bulgaria and Montenegro is a swart and tawny background to the cabaret type of Frenchman and the Mexican character resident in the Quarter.

The water-front is another "feature" of San Francisco life that will repay a brief tour—the Italian fishermen, the stevedores, the 'longshoremen, the nondescript characters who haunt the seawall, the sailor boarding-house runners, the drift and flotsam of a peaceful sea.

The residence section on California-street Hill, Pacific Heights, and Van Ness avenue (the stateliest thoroughfare in the city) will give the stranger a better idea of the individual opulence of San Francisco's prosperous citizens than a volume of essays denouncing the rapacity of the "predatory rich."

Market street, the promenade of San Francisco, is one of the notable streets of the world. Here the beauty and fashion of the town is on parade every pleasant afternoon, and along the "Rialto," between Kearny and Powell streets, the well-dressed throng is constantly moving, from early morning until midnight.

San Francisco is a picturesque city; it is a healthful city. Living is cheap, whether you live in the hotels and boarding-houses or provide for your own home. It is a city that in times of prosperity is more prosperous than any other in the United States, and in seasons of depression sustains the strain of adverse fortune with more equanimity and personal comfort than other communities. It is a city with a splendid future. It is the metropolis of a rich empire, as yet but sparsely populated. Every possibility awaits the proper application of energy, industry, and intelligence; opportunity sits by the Golden Gate, and they are wise who seek it there.

Edwin H. Clough.

"No beautiful palace have I on the hill,
No pictures to hang in the halls,
But never a painter could match with his skill,
The roses that bloom on my walls."

AN ANALYSIS OF LAND VALUES.

THERE is a tolerably defined series of sensations through which the stranger visiting California is reasonably expected to pass, more or less vividly, according to his tastes and temperament. Recently, however, a new phase has been appreciated by those of investigative curiosity roused by an incongruity which is destined to become a serious feature unless shortly counteracted.

Casual conversation with those whom the stranger meets has, unfortunately, the more probable effect of strengthening than of correcting the errors causing the incongruity. The real conditions inducing it do not accord with the conclusions commonly accepted by the people of the State; still less by a certain class of people outside of the State, who are much needed in California, and whose coming would be an incalculable benefit to all concerned, themselves most emphatically included. They will not come, however, so long as the existing erroneous impressions are accepted; hence the incongruity is deplorable.

In every loyal Californian, the stranger finds a man proud as proverbial Lucifer of his State, boasting incessantly of her climate, her soil, her productions, her fish, her game and her minerals, in remunerative capacity unequaled anywhere on earth; all of which, so often claimed and proven, must forsooth be true. It is true. The law allows it and the court awards it.

Then the stranger catches a glimpse behind the scenes and discovers those same men secretly communing with anxious faces, and with vindictive frowns condemning one thing or another, according to their personal convictions or prejudices, or the inordinate obstinacy of inanimate things in general, for that California is dead, business dull, progress, if any, in the wrong direction, development of the marvelous resources at a comparative standstill, and goodness knows what else that is undesirable, disagreeable, and discouraging.

Allowing for natural exaggeration on both sides, one condition is as evident as the other—evident from San Francisco to the remotest corner of the Utopian State. The halcyon paradise is real, but no less real is the dangerous lethargy, and the incongruity is enough to excite a very moderately aggressive curiosity.

Miles and miles of phenomenally fertile valleys, where no snow ever falls and frosts are exceptional, with evergreen foothills, producing everything from the apple, pear, and peach to the orange, olive, and fig, with intermediate grapes, in quality and quantity unequaled, tend to rouse such enthusiasm that one notes with astonishment the lack of small farms, and can hardly believe that there is practically no demand for land, in limited allotments, or any evidence of immigration of that most desirable class of citizens known as small farmers.

How many men live in frigid economy, delving in soil that has been the death of their fathers and grandfathers, and that is uselessly frozen for six months in the year, working furiously through the broiling heat and drought of midsummer to provide for keeping themselves and their stock uncomfortably alive from the fall until another spring.

That veteran agricultural war horse, the Hon. Jeremiah Rusk, after his recent visit to California, recorded the following opinion:

"The enormous yield of the vineyards and orchards are facts which are but little known to the majority of the people, and but few even of those who know them realize the full meaning. To the eastern man who has tilled the farms of twenty and forty acres that his father tilled before him, the farms of this great State (California), are as legends of Fairyland; and when told that, with the same energy he expends on his forty acres, he can farm in California four times forty acres, he becomes incredulous—he cannot imagine such farms as I have seen in that State."

And yet the obdurate reality remains that small farms are very few, and that hardly an occasional inquiry indicates an investigative tendency toward fresh immigration.

Beside a vineyard measured by miles lies a thirty or forty acre farm that is also wholly devoted to grapes—not a pig, or a cow, or a chicken; not a corner, even, given to a kitchen garden or a fruit tree. Sometimes it is profitable running a little craft in the wake of a big ship, but on frequent occasions it is disastrous. It is certainly the poorest policy for a farmer habitually to purchase at retail, the productions of the soil, while unoccupied time and unoccupied corners invariably run to waste. Otherwise a number of small farmers having found lodgment in close proximity, unite in the same industry,—fruit raising, quite as completely ignoring the science of economical self-preservation, so skillfully perfected by eastern producers. The inclination is illustrated in a tale of one of them who, by some unaccountable accident, found himself possessed of a pig. He did not

know what to do with it, but being a humane man he let the creature live as best it could, till it was sufficiently grown for the butcher, then he sold it and, with the proceeds, purchased an imported ham and a bottle of whiskey.

The common course of things is more or less responsible for the position of California, without the aid of any antagonizing element whatever. The industrial development of a country, once started in the wrong direction, can only be set right in a natural way, by a process very slow in producing visible results, and California was started wrong. The first reference to the country, in a report of Cortez to Charles V. of Spain, represents California as "an island rich in pearls and gold." Through three hundred years of growth, under Spanish and Mexican dominion, the one notoriety she obtained was as excellent grazing land; the only service which could reasonably be required of her. As such the vast valleys were largely allotted, in enormous grants, to Spanish and Mexican cattle raisers.

By the treaty of Guadalupe Hidalgo, the United States received California in 1848, not only taking her at the Spanish estimate of availibility, but with a guaranty to respect those original grants covering an area of 8,700,000 acres of the best land.

The following year the gold, to which Cortez referred, brought thousands of prospectors and fortune-seekers to California, but very few adventurers anxious to experiment upon the productive qualities of the soil. The few who did leave the ranks of the miners simply followed the example of the Mexican and Spaniards, acquiring, for grazing purposes, valley lands as vast as possible; and not more than thirty years ago it was still the prevailing impressions in many sections that, when the mines were exhausted, the miners would return to their eastern homes, and California be left once more, to Mexican cattle men and Indians.

Very slowly it became evident that the State was capable of more than pastures and mines. An occasional peach tree, pear or apple shading a miner's door, or a grape vine clinging to his cabin enforced the conviction, and the figs and oranges, prunes and olives growing around the old monasteries and mission stations, all declared that the soil and climate of California offered boundless possibilities for the production of everything semitropical or temperate.

Thus, even at the outset, there was a widespread conviction to the contrary abroad and considerable prejudice and conflicting interests at home preventing California from spontaneously becoming an agricultural State, though by degrees some of the vast pastures were turned into wheat fields and vineyards, with marvelous remunerative results.

Fortunately the cupidity of the large farmers had not absorbed the foothills, and there, in Placer County, for example, small fruit farms found lodgement so effectively that in 1892, 1125 carloads of fruit were shipped from a single district twelve miles long by five miles wide, clearly demonstrating the possibility of profitable small farming in the State; for, in spite of soil and climate and land and water transportation privileges, and even at that late day, it had to be demonstrated to be believed.

Another similar district is the Santa Clara Valley, surrounding the charming little city of San Jose, frequently referred to as the Garden of Eden. It is a perfect paradise of small farms, yielding, producing, and beautiful every month in the year.

It is unfortunate, in a way that, tempted by the phenomenal abundance and perfection of the yield, nearly every small farmer in the State excepting, of course, the Chinese, has devoted his entire attention to fruit culture, not only rendering the question of daily bread a constant and quite important item of expense, but also making it easy for some temporary eccentricity of the market, or unavoidable casualty, to produce a general and possibly serious depression, becoming poignant where, under other circumstances, it would hardly be noticeable. Indeed, it is quite possible that, for self-protection and economy, fruit raising is somewhat overdone—proportionately overdone—adding another misconception and deluding impression for those outside.

That small farming, in the abstract, is not overdone, not even in the remotest degree approaching the infinite possibilities easily attainable, is eloquently evident in an official report from which are copied the following suggestive statistics:—

During the year there was brought to California from the East, 2000 ten-ton car loads of stock, farm, and poultry-yard products; 5,500,000 pounds of eggs alone. There came by rail 13,000,000 pounds, and by sea 70,000 cases of canned goods, fish, meat, corn, and other vegetables. Vast quantities of oats were imported, over 1,000,000 pounds of pickles and jellies, and nearly 4,000,000 pounds of corn meal and oat meal, besides almost inconceivable quantities of other products, all of which could have been better and more cheaply raised in California, irrespective of the cost of transportation. Evidently the freight rates are not a ruinously destructive feature, or the common instincts of self-preservation would prevent the roads from receiving revenue upon so many tons of

coal to Newcastle. But first and foremost appears the incontrovertible evidence of opportunity—golden opportunity—for small farmers; with a large local demand at their doors, with cheapness and ease of culture and personal comfort assured, with quality and quantity of yield unequalled on the earth, and a perpetual protective tariff in the freight charges, which must always he considerable on imported goods.

The large farms have doubtless had a certain obstructive influence, retarding the proper development of the State and the influx of small farmers which one would suppose would instantly follow upon the very discovery of such conditions as California affords, but that it was chiefly fictitious is evident in the fact that there never has been a time when good farms could not be obtained in any size desired; hence something other than railroads and large farms must have aided and indorsed the general misconceptions to have so injuriously restrained immigration. Indeed, the potent secret lies wholly outside of them, in the very pride of the people of the State, and in their inordinate valuation of California.

That, too, is to-day, something of the past, so far at least as it applies to the appraisal of raw land; but it has become such a well-established fact, in the mind of the world at large, that it may prove difficult to eradicate. It was a very real condition, a short time ago, and there is no reasonable doubt that the great obstruction in the way of immigration at the present time lies in an erroneous impression, throughout the East, based upon the past values of land in California.

For thirty years people have been coming to this garden of the Pacific Coast to return with the report that land was held too absurdly high to offer any inducement to invest. The arguments concerning climatic limitations, the absence of winter, the intensive culture and more profitable productions as adding to the original value of raw land, were all very satisfactory to Californians, but in the shrewder calculations of eastern farmers, did not "butter the turnips."

Land, as a rule, acquires a value correlated to the density of the population; but California was an exception. When her phenomenal possibilities were discovered the land at once sympathized, in advance, with the value of the intensive culture. When grapes sold for $40 a ton, and it was found that vines would yield six to eight tons to the acre, grape land, though not planted, instantly assumed a fictitious value; while the productive possibilities of every month of the year, and the ability of domestic animals to subsist without the storing of forage, gave even to grazing lands a value attaching to twelve months, instead of the five or six that are available in the East.

All these are very real and potent inducements, and the buyer, when he goeth his way, assuredly and justifiably boasteth; but while Californians looked on the outward appearance, as every new comer will also the moment he, too, is established as a Californian, the prospective purchaser looks only on the heart; and now, at last, the time has come when he can purchase accordingly.

Natural and artificial processes combined have forced a proper valuation of raw land. The decline in wheat has brought some heavily mortgaged large farms into the market, through foreclosure, and competing with them, unmortgaged land has lost its fictitious value, till throughout California to-day, there are presented the most favorable conditions for settlement that have existed since the foundation of the State.

Let it be distinctly understood, however, that this is a healthful decline and only pertains to uncultivated soil; that while land rated as "raw" is offered at lower prices than at any time during the past thirty years, the significant fact remains that orchards and vineyards command a higher price than ever before. It is the inevitable though slow adjustment of supply and demand; the arrangement of cause that must, eventually, effect an influx of that class the need of which is so vitally felt in the State to-day.

Land owners did not instigate or take kindly to the depreciation. It could hardly have been expected of them. Some who are favorably circumstanced still cling to the old rates, and the old reasoning; but the decline is not limited to localities,—only the exceptions are limited,—and there has not been a period in her history when, in California, as a whole, the cultivator of the soil could invest a moderate sum in unimproved land with such confidence and assurance as now.

Other necessities for development have declined in like manner. Young trees and vines for planting, which five years ago cost fifty cents, now sell for nine and twelve cents apiece, and it is a fact that cannot be too widely known that a man can produce an orchard, or bring a vineyard to bearing in California to-day, for about forty per cent. of any previous figures, besides having a much better selection of locality than formerly.

The most fertile land in California can be bought to-day for thirty per cent. of what was asked for it in 1890. All over the State small farms can be secured, land upon which snow never falls and where frosts are almost unknown, land that will produce something every month of the year, and capable of every object of culture that is raised between the Mediterranean and Norway, at a lower

price than is asked in Ohio, Indiana, Illinois, Wisconsin, Minnesota, or Iowa, where winter consumes the summer's product, and there are scarcely five months available out of the twelve.

In Butte County, for example, orchard land which sold readily for $150 an acre in 1885, is now eagerly offered at forty dollars an acre. In the San Joaquin Valley, land is freely offered to-day at twenty dollars, which ten years ago would have been called extravagantly cheap at $100, and good fruit land is selling at $40, which in 1890 easily commanded $150 an acre.

These statements are startling, even to many Californians not acquainted with the facts, but they are all indorsed by actual transactions and can be easiiy verified by application to any government, local, or railroad land department in the State, and it is these changed conditions which ought, by some means, to be carried with convincing force to those who, if properly informed, would find in them valuable food for thought, and instigate to action.

At a regular meeting of the State Board of Trade, held in the rooms of the Board, at No. 16 Post street, June 15, 1897, the following Preamble and Resolutions were unanimously adopted:—

WHEREAS, The foregoing articles have been submitted for examination and approval by this Board, now, therefore,

Resolved, That the Board commends said articles, as treating in a thoughtful and conservative spirit the subject-matter to which each article relates, and that the contents of this book are hereby presented to the public, fully endorsed by this Board;

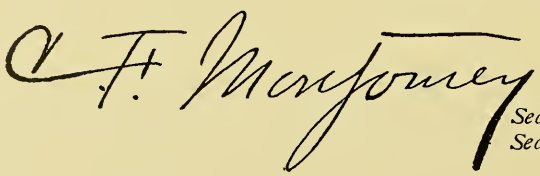
Resolved, That the thanks of this Board are due and are hereby extended to the Committee of Publication for the suggestion, the plan, and the execution of this work.

It is hereby ordered that the foregoing resolutions be published in the book as an attestation of its endorsement by this Board.

By Order of the Board.

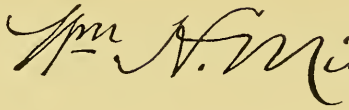
President, Tehama Co.

Vice-President, Alameda Co.



Second Vice-President, Secretary and Manager, Contra Costa Co.

Secretary and Manager.



Chairman Com. on Publication,
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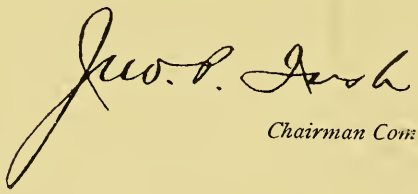

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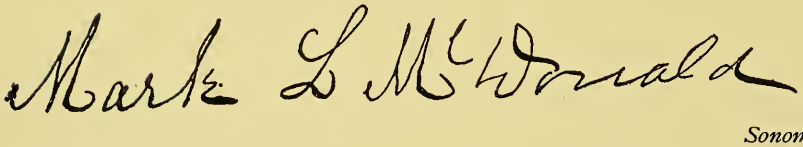

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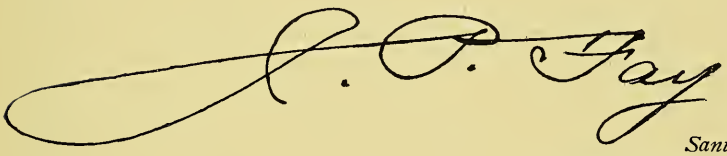

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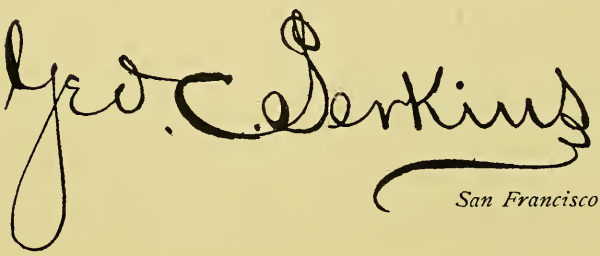


San Francisco City and County.

IN A VINE-GROWING VALLEY.

By Charles A. Wetmore.

"WARM day! Sir," said the Tenderfoot, as he sat in his buggy in front of a pretty cottage, on the edge of a brisk little town in the California Coast Range. "I am thirsty," he added; "may I have a glass of water?"

"Come in and welcome," was the hospitable reply of the country Doctor, at whose door the stranger had halted. A few minutes later he was seated on the porch of the Doctor's cottage, under a shading grape vine.

"Cool off a little first," the physician advised. "Don't drink too much water when you are very warm. Try a little wine and Shasta water first. Do you prefer claret?"

"Wine! Oh! Never!" the Tenderfoot exclaimed; "pure water for me,—always."

"I'm afraid you often suffer from thirst then," was the laughing response; "pure water is a difficult thing for a traveler to find. Ordinary drinking water is the source of many diseases, and carelessly taken is the cause of the great epidemics and plagues that periodically destroy millions of people in the various parts of the world. Excuse me, however, sir, for I, too, am partial to pure water, when I can get it. Here is some from a filter,—help yourself, sir."

"Water's a little warm, Doctor," the stranger suggested." "Hard to keep it cool?"

"Sometimes," the Doctor replied; "but I generally have it cool in the olla. I never use ice in it."

"Not ice? Why, I couldn't get along without ice at home."

"Then you seldom drink pure water, sir. Water is not purified by freezing, and ice from ponds generally is impure, and often is a source of contagion, because ice ponds are often frozen cesspools. Typhus germs may be found in a block of ice."

"You live in a wine country, Doctor. Do you advise the use of wine?" inquired the Tenderfoot, who, despite his prejudices, was eager to pick up information on his travels.

"That is a broader question than it may seem to you, sir," said the Doctor. "I never advise the use of wine without knowing a good deal about the habits and temperament of the person. Absolutely pure water, which is, as I said, difficult to procure, except under certain conditions, is always safe to advise, and for most people, no doubt, the safest drink; so we might theoretically speak of certain simple uncooked foods. It is generally safest, however, to boil the water and cook the food. Civilization makes a more or less high art of both food and drink, and it is only to the temperate that we should reveal and advise the innocent pleasures that art affords in gratifying our palates. We may condemn habits oftener than we may approve them. Take water, for instance. We can frighten the world by showing how much misery it has caused through impurity, and how much dyspepsia results from ice-water tippling; yet water is essential as an element of drink. Some use it as Nature gives it; others, like the Chinese picking grapes in the hot sun yonder, drink it only after boiling and as warm tea. The Chinese are noted for their immunity from epidemics, because they do not drink what is called pure water and because they are temperate in the use of their light stimulant; but they are of an older civilization than ours and have eliminated many of the savage impulses which lead to intemperate self-indulgences. Yet, being older, less sanguine and less aggressive, they take to narcotics. They have little to live for; so they prefer sleep. Civilizations emerging from savage conditions often run riot in the indulgence of their passions or emotions, whether in religion or diet. So we find races for whom wine is dangerous and others for

whom it is apparently, at least, harmless and at the same time conducive to general happiness. In this country we have such a mixed people that no rule can be laid down. We must let individual families judge for themselves, while always condemning intemperance."

"Well, Doctor, you admit that there may be a question of intemperance in the use of wine, do you not?"

"Undoubtedly! As in everything else. Men of intemperate habits of mind find intemperance in all practices, according to their dispositions and environments. Intemperance in the gratification of the stomach manifests itself in many forms. Its chief cause is irregularity in habits of eating and drinking. Those who never eat or drink except at stated times and never solely for social enjoyment are seldom, if ever, sufferers from intemperance. Wine drinking, as a rule, should be indulged by those who drink only at their meals; but, if wine is partaken on all possible social occasions and at all times of the day, the habit may be regarded as intemperate, and is certainly often dangerous to health. Americans generally are poor wine drinkers because the greater number of them eat and drink irregularly and forget that their stomachs were not made to play social tunes upon. Intemperate drinkers think that nothing can happen without calling their palates to celebrate or sympathize. That's why we have so many saloons, ice cream parlors, candy shops, soda water fountains and the like. In many homes a visitor is scarcely seated before he, or she, is offered some form of intemperate indulgence, whether wine, soda water, lemonade, ginger pop, cake or candy. They begin it with the children, offering them lolly pop and cake at all hours. If our people had correct habits of eating and drinking only at regular meals, you would hear the question of intemperance in wine raised only in exceptional instances, as with the glutton. Cure the habits of the people in this respect and the saloon question will dwarf to insignificant proportions. It does little good to attack one form of intemperance and leave all others unchecked. I know many American families where good habits prevail, and in them I see nothing to condemn in the usual wine drinking at meals. So far as it adds pleasure and cheerfulness to daily life it is a positive benefit. Americans, however, are not forming the habit of wine drinking very fast; indeed the per capita consumption of table wines is not materially increasing. The increase of production only keeps pace with the population. That is why the planting of vineyards is not likely to increase rapidly. The apparently innocent barley and corn fields are the resources of most of the intemperate classes. Iowa turns out more drink material than California. So far as people will drink fermented and distilled beverages, the influence of vineyards in California is at least more refining and tends towards better habits without increasing in any appreciable way the evils of intemperance. Wine makers, I find, are generally indifferent as to assaults on the saloon habits, because comparatively little of their products is sold in the saloons."

The Tenderfoot drank another big glass of water, and, after reflecting awhile, renewed the conversation.

"Doctor," said he, "I am traveling in California to renew my health, if possible, and am desirous of settling in a community of good habits, such as I approve. I am in doubt because I do not find the New England steadiness of social customs, and I have been fearful of the future of a country where so much saloon life is visible. I have thought that the future of a wine-making country would not be hopeful."

"My dear sir!" exclaimed the Doctor, "have you forgotten that the wealth, culture and aristocratic society of New England was founded on the rum and slave trade? New England bought molasses and made rum; exchanged rum for negro slaves; sold slaves and bought more molasses. Do you forget that a barrel of rum was invariably an item of expense in a Connecticut church raising? Do you forget that the Puritans came seeking a country all to themselves and found that they had to live with Quakers and afterwards with Unitarians? You will find no country in these days where any school of moralists can live long to

themselves, even if they start isolated colonies. Society is complex everywhere nowadays, and each family must learn to live after its own taste and disposition. You cannot predict the future of California from present occupations of a part of the people with any better success than your great-grandfather could have predicted the society founded by New England rum makers and slave dealers. Education and refinement, as it eleminates the savage inpulses, builds on that which survives the test of human progress. Restrictive laws have no more lasting influence than the Blue Laws of Connecticut. Your best indication of the future of this State is in the schools and colleges. Chauncey Depew, when he reported on his discovery of California, told the Eastern people that he had found the finest buildings in every town to be the school houses. If the schoolmaster leads here, as in New England, why should you fear for our future? Education and industry will soon overcome any incidental evil influences of any industry. So far as the wine maker in this State is a means towards cheerful and happy life, be sure that his industry will stand. So far as his products may be used intemperately, be sure it will be the fault of education and home discipline. So far as intemperance may continue, it will not be the fault of the vineyards but of the grain fields.

"Thank you, Doctor. I must be going. I feel thirsty yet; another glass of water, if you please; it seems as though I could not drink enough," and the stranger rose.

"No doubt your stomach is a little out of order," replied the Doctor, passing the water pitcher. "Did you not eat too much pie and pancakes for breakfast?"

"Well, perhaps I did; I am very fond of pastry and warm bread."

"That is a common complaint. Those who do not drink wine at their meals generally satisfy their palates with sugared food. You seldom see a wine drinker who indulges in cake and pastry. He gets his hydro-carbon indulgence without sugar, and, if he is temperate, with less injury to his stomach. The intemperate use of sugar produces probably as much disease as alcohol. Dyspeptic irritability often causes the intemperate use of water, which increases the difficulty. I would advise you to try claret and water at your meals, cold, well-baked bread for breakfast, and abstinence from cake, pie and candied desserts. Above all be careful that the water you drink is pure. When in doubt, see that it is boiled. Unless you are careful, water drinking is a dangerous habit."

"Good-bye, Doctor. You have set me to thinking."

The Tenderfoot went his way seeking more knowledge of California. "That Doctor is a crank on water! said he to himself at his hotel, after ordering his pitcher of ice water.

The Doctor smoked his pipe on his porch. "That Tenderfoot is a crank on wine," he muttered. "But he'll get over it as they all do."

FOOD FISHES OF CALIFORNIA.

By David Starr Jordan.

OF the rivers of California, the Sacramento is the richest in food fishes, and its fish are the most valuable. Although a great deal of fishing has taken place and the splendid exuberance of life which distinguished the Sacramento in its earlier days has now passed away, yet there are few rivers in the world passing through a region of civilization in which the fishery products have the importance of those of the Sacramento. Only the Columbia River would excel it in these regards. The Yukon is larger than either and is stocked with fish, but

its fishes are not so intrinsically valuable, and the larger part of the course of the stream is far away from civilization.

THE SALMON.

The most valuable fish of the Pacific Coast is the quinnat or king salmon (*Oncorhynchus tschawytscha.*) This fish reaches, in the Sacramento, an average weight of sixteen pounds, but older individuals, which have probably survived the spawning season, have been taken weighing as high as seventy to one hundred pounds.

This species is the greatest of all the known salmon, and on the whole its flesh is the richest and best flavored. On the Columbia River it is canned in great numbers, and in less numbers along the Sacramento, and it is the standard salmon of commerce.

The other four species of salmon, the humpback, the blueback, the dog salmon and the silver salmon, so abundant in Oregon, Washington and Alaska, are only occasionally taken in California.

Of these species the blueback predominates in the Fraser River and in the Yukon River, the silver salmon and the humpback in Puget Sound, the quinnat in the Columbia and the Sacramento, and the silver salmon in most of the streams along the Coast. All the species have been seen by me in the Columbia and Fraser River; all but the blueback in the Sacramento and in waters tributary to Puget Sound. Only the quinnat salmon has been noticed south of San Francisco. Its range has been traced as far as Ventura River. Of these species, the king salmon and blueback salmon habitually "run" in the spring, the others in the fall.

The economic value of the spring-running salmon is far greater than that of the other species, because they can be captured in numbers when at their best, while the others are usually taken only after deterioration. To this fact the worthlessness of the dog salmon, as compared with the other species, is probably chiefly due.

As already stated, the economic value of any species depends in great part on its being a "spring salmon." It is not generally possible to capture salmon of any species in large numbers until they have entered the rivers, and the spring salmon enter the rivers long before the growth of the organs of reproduction has reduced the richness of the flesh. The fall salmon cannot be taken in quantity until their flesh has deteriorated; hence the dog salmon is practically worthless, except to the Indians, and the humpback salmon is little better. The silver salmon, with the same breeding habits as the dog salmon, is more valuable, as it is found in the inland waters of Puget Sound for a considerable time before the fall rains cause the fall runs, and it may be taken in large numbers with seines before the season for entering the rivers. The quinnat salmon, from its great size and abundance, is more valuable than all the other fishes on our Pacific Coast taken together. The blueback, similar in flesh, but much smaller and less abundant, is worth much more than the combined value of the three remaining species of salmon.

OVER-FISHING.

The utter disappearance of the salmon fishery of the Columbia is only a question of a few years unless some vigorous means is taken to prevent overfishing, to prevent the destruction of young fish, and to replenish the losses from all these causes. The same story of the destruction of the rich fisheries of the Columbia will be told again in the Fraser River and in the Yukon, and in every other stream where unlimited fishing is allowed, and where no adequate effort is made to keep up the supply.

CALIFORNIAN TROUT.

The steelhead trout (*Salmo gairdneri*) is also found in the rivers of California in the spring, running with the quinnat. The name salmon trout is often applied

to this fish, which is indeed very much like the true salmon trout of England, but the name steelhead seems to me very much preferable because it is not given to any other fish.

The steelhead usually weighs six to twelve pounds, but it occasionally reaches twenty or even twenty-five pounds. Those seen at the mouth of the river at the time of the early salmon runs are evidently spent fishes. They are lean and lank, the flesh is pale and poor, and the bones are hard, for all of which reasons it is, or ought to be, rejected by the canners, although there is no doubt that the steelhead, when taken at its best, may be one of the finest of all trout. It certainly reaches the largest size of any other real trout in any country.

Steelheads are most abundant in the Columbia, but they are common in the Sacramento, as well as in the Klamath, the Eel River, and the streams about Monterey. It is not unlikely that most of the trout in the coastwise streams of Northwestern California belong to this species.

As the salmon has declined in number, the steelhead has become relatively more important, and is now largely brought into the market, and even canned; but it has no great commercial importance, and as a food fish it should be taken earlier in the season than the time of the salmon runs.

In the smaller streams about San Francisco is found the rainbow trout (*Salmo irideus*). This is very similar to the steelhead, but much smaller in size, with more spots, and with larger head and smaller mouth. It is subject to many variations, and its value is mainly to the anglers, who will find it in abundance in any of the streams tributary to the lower Columbia. Apparently the rainbow trout does not go out to sea.

More important than the rainbow trout, and reaching the larger size, is the cut-throat trout, which is found in Lake Tahoe and the Truckee River, as well as in the streams of Humboldt and Del Norte counties. The cut-throat trout is easily distinguished from the others by its smaller scales, and especially by the deep orange-colored blotch partially concealed by the branches of the lower jaw on each side. This trout does not often descend to the sea, but in all of the small streams and lakes to the eastward it is abundant, and furnishes excellent sport. In the steelhead and rainbow trout the red dash under the throat, the mark of the cutthroat or Sioux Indian, is never found. From the rainbow trout the young steelhead can be most easily distinguished by its smaller scales, there being in the rainbow trout about 130 in the lateral line and in the steelhead about 150.

In the upper waters of the Sacramento and in the colder streams of the Cascades is found the charr, known as the brook trout or dolly varden. This is the finest of all the trout-like fishes on the Coast. It is known from all the others by the fact that its scales are extremely small, and the spots on its body are pink or gray. In specimens in clear waters where the colors are very dark the spots are bright crimson, but in sea-run specimens the body becomes light gray and the spots themselves fade away. The charr sometimes reaches a weight in salt water of eleven pounds, but in mountain streams specimens weighing even a single pound are rare.

Farther to the northward the dolly varden trout becomes very abundant, and in the Aleutian Islands it swarms not only in every brook and lake, but in every arm of the sea, and in Alaska it becomes a nuisance by devouring the eggs and young of the salmon.

THE STURGEON.

The common or white sturgeon is the only one valuable for food. It reaches a length of from eight to ten feet or more, and is said to attain a weight of 400 to 500 pounds; the largest seen by me weighed about 150 pounds. It is found in the mouths of all large rivers in abundance, ascending the Columbia at the time of the salmon run, and for the same purpose of spawning. The flesh of the sturgeon is rather coarse and not especially well-flavored. It is therefore very much cheaper than the salmon, and has in the Columbia, at present, little importance. Its flesh is sometimes smoked, especially by the Indians, and caviare made from its roe.

The green sturgeon is also found in the Sacramento River, but is much less common, and is said to be poisonous; what justification this evil reputation has I do not know.

There is also a lamprey in the Sacramento River, reaching a length of a foot or two. Its rich oily flesh, like the flesh of the eel, ought to make it good eating, but I have never heard of its being brought into the market.

The squaw fish is a coarse, overgrown chub, with a long, slender body and a pike-like head, but like other chubs is destitute of teeth. It reaches a length of three to four feet, and it runs in the small streams in the spring to spawn. It is sometimes brought into the market, but its flesh is rather tasteless and it is full of bones. Besides this there are three or four other chubs found in the Sacramento, rarely reaching a length of more than a foot, and all similarly inferior in flavor.

The family of suckers is also represented in the Sacramento by one very common species. They reach a length of one to two feet. The flesh is very soft and poor as well as being full of bones. In a region like California, stocked with better fish, the sucker is only valuable as food for these.

HERRING, SMELT AND PERCH.

All along the coast of California the herring is found in great abundance. This species is very similar to the herring of the Atlantic and about the same size, but its abundance is even greater. When fresh it is a most excellent food fish, and it comes in large quantities to the markets. At present very few herring are smoked, but in some regions many are destroyed for the oil which is pressed from their bodies.

Another fish of the herring family is the California sardine, which is taken in large quantities off the coast southward. It is an excellent fish.

The smelt family is represented by a number of small species less than a foot long. Of these the most valuable is the eulachon, often called the candlefish because of its extreme fatness. This species comes occasionally into the San Francisco market from Fraser River. They run in considerable numbers up the river in the spring, depositing spawn in gravel beds probably about thirty miles from the sea. Of all the food fishes of America, the eulachon is the most delicate, and when fresh and properly cooked the finest in its flavor.

The surf smelt is another excellent species of delicate flesh and fine flavor. It does not enter the river, but is found about its mouth along with the still smaller and less abundant California smelt.

The term smelt is often applied to a group of silversides or fishes of the king. These have great importance on the coast of California, the flesh being firm and of good flavor.

THE ROCK FISH.

Equally abundant and characteristic of the Pacific Coast is the great family known as rock fish, commonly known as rock cod, although they have no resemblance to the real cod. Of this group there are about forty species, some of them green or black in color, looking like black bass, and others of various shades of yellow and bright red. The red species live in the deepest water and have the roughest and most horny heads. All the species are found about rocky reefs, many of them at considerable depths, and they always stay close at home, never migrating and the individuals never moving far from the rock to which they belong. They are all voracious, taking the hook readily and feeding upon other fishes. They are all fairly good food fish; the flesh is fine and white, of fair flavor, but a little coarse.

Not unlike the rock fish in habits and bright colors is the group of rock trout. These reach a length of about two feet, are dark greenish in color, usually with red spots or ornamentations. They live about rocky places, and the flesh is of fair quality.

Another fish of this type is the so-called cultus cod, or blue cod. This fish bears some resemblance to the codfish. It reaches a length of about five feet and a weight of fifty or sixty pounds. Its flesh is blue or green in color and of fair quality. This is one of the most important of the salt-water fishes of the Oregon coast. Akin to it is the black candlefish or beshow. This is a good food fish, black in color, reaching a length of nearly two feet and a weight of about five pounds.

The sculpin family is numerously represented on the Coast, some of the species reaching a considerable size. The flesh of all is white, rather tasteless and tough, and none are of economic importance. Some of the species infest the fresh-water streams, where they feed persistently on the eggs of trout, doing a great amount of mischief.

The species of hake, pollack, tom cod, and other cod-like fishes, are often taken off the coast of California. The tom cod, which is a very small cod, about a foot long, is the most abundant and the most valuable of these. Its watery flesh is not bad-flavored, and it meets with a ready sale in the market as a pan fish.

The great codfish of the Pacific is occasionally taken in deep water off the coast of Washington, but has no importance as a fish of California.

The flounders are very abundant on the sandy coasts of California, the most important being the starry flounder, which often ascends the mouths of rivers. This is a good food fish, and reaches a weight of twenty pounds. The smaller individuals, however, are much better than the large ones. The other species of flounder are smooth-skinned, less varied in color and smaller in size. These are usually sold in the markets as sole, but the true sole is not found on the Pacific Coast.

To the flounder family belongs the halibut, which reaches a very great size, and is taken in small numbers off certain reefs of the Washington coast. Though brought into the markets of San Franisco it is not properly a California fish.

THE COAST FISHERIES.

The fisheries of the coast are as yet very little developed. Collins estimates that on the seven thousand miles of coast of California, Oregon and Washington, the fisheries are about equal to those of the five hundred miles of the coast of New England. The value of the Pacific Coast product was estimated at $10,000,000, that of New England at $15,000,000. In the ten years between 1880 and 1890, the number of pounds of fish caught in California has increased from 14,000,000 to 23,000,000. At the same time there has been a considerable falling off in the fishes of Oregon, and a smaller apparent gain in the fisheries of Washington. But this change is probably due to the fact that most of the salmon catch in the Columbia was attributed to Oregon in 1880, and in 1890 distributed between Oregon and Washington.

Comparing in detail the report of Jordan and Gilbert, in 1880, on the fishes of California, with the report of Wilcox and Collins, in 1890, I find that the number of fishermen in California had increased from 3,094 to 4,731, an increase a little less than proportionate to the increase in the number of pounds of fish caught. The average fisherman in 1880 caught 4,660 pounds of fish in the year; while the average fisherman in 1890 caught very nearly 5,000 pounds.

INTRODUCING EASTERN FISH.

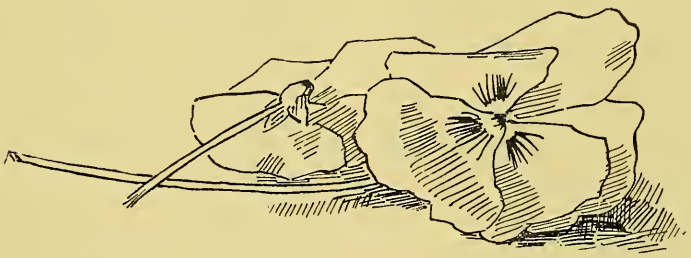
The first Eastern fish to be introduced into the rivers of California was the brown catfish (*Ameiurus nebulosus*), which at once adapted itself to its surroundings, and has inordinately multiplied itself in the sluggish waters of the Sacramento and San Joaquin rivers. This is a very good food fish, very hardy, and probably better than most of the native fishes which it is intended to supplant. One of these, however, the so-called river perch or rock bass of these streams, is certainly disappearing as the catfish extends its range, and is better both as a game and as a food fish than the catfish is. The catfish has been well established

for about fifteen years. The original specimens were brought from the neighborhood of Philadelphia.

Since 1880, whether intentionally or not, I do not know, another species of catfish has been brought in, apparently from the Potomac River. This new form, the *Ameiurus catus*, may be known from the other by its forked tail. As food fishes, or in other respects, there is little choice between the two.

The European carp is also now well established in the Sacramento River, where it seems likely to become a positive nuisance. As a food fish it is inferior to almost everything else on the Coast, and hunters complain that it is destroying the vallisneria, or so-called water celery, on which the canvasback duck feeds, and to which its delicious flavor is usually attributed. In any event the carp can form no valuable addition to the river fishes of California. Its value rests on the fact that in ponds it grows very rapidly, and will feed on almost anything.

The introduction of the shad, which took place some fifteen years ago, has been an unqualified success. It is one of the very best of food fishes, and it has made itself thoroughly at home in the rivers of California, Oregon and Washington. It may now be found in the markets at all times of the year. It has crowded out no other species of fish, and there has been nothing but gain from its introduction. The same may be said of the later introduction of the Eastern striped bass. It is not yet as abundant as the shad, but large specimens may often be seen in the markets, and it is destined to become one of the most important food fishes of the Pacific Coast, as it has long been of the Atlantic.



SPANISH AND INDIAN NAMES.

VERY few of the Spanish names of places in California are pronounced correctly by Americans. In the pronunciations given below in this list of the more widely known names, the popular pronunciation is given in preference to that which is exactly correct, with a leaning toward the correct sound. In Spanish, a is pronounced as a in "father," e as a in "state," and i as e in "me"; but in unaccented syllables these sounds are obscure. There are certain difficulties with regard to some of the consonants, but they receive little respect from Americans. By following the rough guide here set up, the stranger will run little risk of making too radical a departure from local custom.

ALAMEDA [al-ah-MAY-dah]. Poplar grove; public walk.
ALAMITOS [al-ah-MEE-toce]. Little poplars.
ALCATRAZ [al-cah-TRASS]. Pelican.
ALMA [AL-mah]. Spirit.
ALMADEN [al-may-DEN]. The mine. (Arab.)
ALVARADO [al-vah-RAH-do]. Name of a family.
ALVISO [al-VEE-so]. Name of a family.
AMADOR [am-ah-DORE]. Lover.
APTOS [AP-toce]. Indian name.
ARROYO [ar-RO-yo]. Creek—a general term.
ASUNCION [ah-soon-cee-OAN]. Elevation.
ATASCADERO [ah-tass-cah-DAY-ro]. Quagmire.
BENICIA [bay-NEE-ce-ah]. Meant for Benecia (or Venecia). Venice.
BERNAL [ber-NAL]. A family name. Literally, vernal, green.
BOCA [BO-cah]. Mouth, entrance.
BOLSA [BOLE-sah]. Pocket.
BUENA VISTA [BWAY-nay VEECE-tah]. Good view.
CABAZON [cab-a-SOAN]. Tax registrar, shirt collar.
CALAVERAS [cal-ah-VAY-rass]. Skulls.
CALIENTE [cal-e-EN-ty]. Hot.
CANDELARIA [can-day-LAH-re-ah]. Candlemas.
CARMELO [car-MEL-o]. Carmel.
CARNADERO [car-nah-DAY-ro]. Literally, bait-maker.
CARPENTERIA [car-pin-tay-REE-ah]. Carpenter-shop.
CASA BLANCA [CASS-ah BLAN-cah]. White house.
CAZADERO [cas-ah-DAY-ro]. Place for pursuing game.
CERRITOS [cer-REE-toce]. Little hills.
CHICO [CHEE-co]. Small.
CIENEGA [cee AY-nay-gah]. Marsh.
COLORADO [col-o-RAH-do]. Red.
COLUSA [co-LOO-sah]. An Indian name.
CONTRA COSTA [CON-trah COCE-tah]. Opposite coast.
CORONADO [cor-o-NAH-do]. Name of a family.
COYOTE [ki-YO-ty]. A species of wolf.
DEL NORTE [del NOR-ty]. Of the north.
DOS PALMAS [doce PAHL-moce]. Two palms.
DUARTE [dwar-ty].
EL CASCO [el CAS-co]. The cranium.
EL DORADO [el do-RAH-do]. Gold field.
EL TORO [el TO-ro]. The bull.
EL VERANO [el vay-RAH-no]. The summer.
ENCINITAS [en-cee-NEE-tahss]. Little oaks.
ESCONDIDO [es-con-DEE-do]. Hidden.
ESPARTO [es PAR-to]. Spanish grass.
FRESNO [FREESNO]. Ash tree.
FRUTO [FROO-to]. Profit, income.
GABILAN [gab-e-LAN]. Sparrow hawk.
GUADALUPE [gwah-day-LOO-py]. Literally, wolf river.
INDIO. Indian.
INYO [IN-yo]. An Indian name.
HOTEL DEL MONTE [hotel del MON-ty]. Hotel of the forest.
LAGUNA DEL REY [lah-GOO-nah del ray]. Lake of the king.
LA JOYA [la HO-yah]. The jewel.
LINDA ROSA [LIN-dah RO-sah]. Pretty rose.
LOBOS [LO-boce]. Wolves.
LOMA PRIETA [LO-ma pre-a-tah]. Dark slope.
LOS ANGELES [loce ANG-a-less]. The Angels.
LOS BAÑOS [loce BAN-yoce]. The baths, or swimming pools.
LOS GATOS [loce GAH-toce]. The cats.
LOS NIETOS [loce ne-A-toce]. The grandchildren.
LOS OLIVOS [loce ol-E-voce]. The olive trees.
MADRONE [mad-ROAN]. A California tree. (Proper form, madroño.)
MAJELLA [mah-HEL-lah]. Probably meant for Mæla (mah-A-lah), contraction of Ysmæla, Spanish feminine of Ishmael.
MANZANITA [man-sa-NEE-tah]. Little apple.
MARIN [ma-REEN]. Name of an Indian chief.
MARIPOSA [mar-e-PO-sah]. Butterfly.
MARTINEZ [mar-TEE-ness]. Name of a family.
MENDOCINO [men-do-CEE-no]. An Indian name.
MERCED [mer-CED]. Mercy.
MILPITAS [mil-PEE-tass]. Meadow.
MODESTO [mo-DES-to]. Modest.
MOJAVE [mo-HAH-vy]. Name of an Indian tribe.
MONO [MO-no]. An Indian name. Spanish meaning, monkey.
MONTE DIABLO [MON-ty de-AH-blo]. Devil mountain.
MONTEREY [monty-RAY]. Literally, king's mountain, or the king.
MOROCOJO [mo-ro-CO-ho]. Literally, lame Moor or lame negro.
OJAI [O-hi].
PACHECO [pay-CHAY-co]. Name of a family.
PAJARO [PAH-hah-ro]. Bird.
PALO ALTO [PAH-lo AHL-to]. Tall tree.
PALOMA [pah-LO-mah]. Dove.
PARAISO [pah-RI-so]. Paradise.
PASADENA [pass-a-DEE-nah].
PASO ROBLES [PASS-o RO-bless]. Oak pass. (Properly, El Paso de Robles.)
PESCADERO [pess-cah-DAY-ro.] Fishmonger.
PINOLE [pe-NO-ly]. A fermented drink of sugar, ground corn, and water.
PLACER [PLASS-er]. Gold-bearing gravel.
PLAZA [PLAS-ah]. Public square.

PLUMAS [PLOO-mas]. Feathers.
PRESIDIO [pra-CEE-de-o]. Garrison.
PUENTE [poo-EN-ty]. Bridge.
REDONDO [ray-DON-do]. Round.
RINCON [rin-COAN]. Place where two corners meet.
RIO [REE-o]. River.
SACRAMENTO. The Sacrament.
SALINAS [sa-LEE-nas]. Salt pits.
SAN ARDO [san AR-do]. St. Ardo.
SAN BENITO [san ba-NEE-to]. St. Benedict.
SAN BERNARDINO [san ber-nar-DEE-no]. St. Bernard.
SAN BRUNO. St. Bruno.
SAN BUENAVENTURA [san bway-nah-ven-TOO-rah]. St. Bonaventure.
SAN CARLOS [san CAR-loce]. St. Charles.
SAN FILIPE [san fa-LEE-py]. St. Phillip.
SAN FERNANDO [san fer-NAN-do]. St. Ferdinand.
SAN FRANCISCO. St. Francis.
SAN GABRIEL [san gab-re-EL]. St. Gabriel.
SAN JOAQUIN [san hwah-KEEN]. St. Joachim.
SAN JOSE [san ho-SAY]. St. Joseph.
SAN JUAN [san HWAHN]. St. John.
SAN LEANDRO [san la-AN-dro]. St. Leander.
SAN LORENZO [san lo-REN-so]. St. Laurence.
SAN LUCAS [san LOO-cas]. St. Luke.
SAN LUIS OBISPO [san LOO-is o-BIS po]. St. Louis Bishop.
SAN MATEO [san ma-TAY-o]. St. Matthew.
SANTA ANA [santa AN ah]. St. Ann.
SANTA BARBARA. St. Barbara.
SANTA CATALINA [SAN-ta cat-a-LEE-nah]. St. Catherine.
SANTA CLARA. St. Clara.
SANTA CRUZ [santa CRUCE]. Holy Cross.
SANTA INEZ (or YNES, or INES, or YNEZ [santa E-ness]. St. Agnes.
SANTA ISABEL (or YSABEL) [santa eece-ah-BEL]. St. Elizabeth.
SANTA LUCIA [santa loo-CEE-ah]. St. Lucy.
SANTA MARGARITA [santa mar-ga-REE-tah]. St. Margaret.
SANTA PAULA [santa POW-lah]. St. Pauline.
SANTA ROSA [santa RO-sah]. St. Rose.
SARATOGA. Healing waters. (Indian.)
SAUSALITO [sow-say-LEE-to]. Small elder-grove.
SEQUOIA [se-QUOI-ah]. Name of a Cherokee chief, who invented an alphabet of his language.
SHASTA. Stone house, cave. (Indian.)
SIERRA MORENO [se-AIR-rah mo-RAY-no]. brown mountains.
SIERRA NEVADA [se-AIR-rah nay-VAH-dah]. Snowy mountain range.
SISKIYOU [sis-ki-YOU]. Indian name.
SOLANO [so-LAH-no]. East wind.
SOLEDAD [sole-a-DAHD]. Solitude, a desert.
SONOMA [so-NO-mah]. Valley of the moon. (Indian).
SONORA [so-NO-rah]. Zither.
SOQUEL [so-KEL]. Indian name.
STANISLAUS [stan-is-LAUSE]. Proper name.
SUNOL [soon-YOLE]. Name of a family.
TEHACHAPI (or TIA CHEPA) [te-HATCH-a-py]. Aunt Josie.
TAHOE [tah-o]. Big water. (Indian.)
TAMALPAIS [tah-mahl-PAH-eece]. Land of the Tamal (or Tomol) Indians.
TASSAJARA [tas-sah-HAH-rah].
TEJON [tay-HOAN]. Badger.
TEMESCAL [tem-es-CAL]. Sweatbox. (Indian.)
TIA JUANA [TEE-ah HWA-nah]. Aunt Jane.
TIBURON [tee-boo-ROAN]. Shark.
TRES PINOS [tress PEE-noce]. Three pines.
TULARE [too-LAH-ry]. Place covered with tules (rushes).
TULE [TOO-ly]. Bulrush.
TUOLUMNE [too-OL-um-ny]. Name of an Indian tribe.
VACAVILLE [VAC-ah-ville]. Vaca is the name of a family. Literally, cow.
VALLEJO [val-YA-ho]. Name of a family.
VENTURA [ven-TOO-rah]. Venture, risk, luck.
YOLO [YO-lo]. Rush-covered marsh. (Indian).
YOSEMITE [yo-SEM-e-ty]. Large grizzly bear. (Indian.)
YUBA [YU-ba]. Indian name.
ZAYANTE [zy-AN-ty.]

PLANTING OF THE MISSIONS.

San Diego de Alcalá	July 16, 1769
San Carlos Borromeo	June 30, 1770
San Antonio de Pádua	July 14, 1771
San Gabriel Arcangel	September 8, 1771
San Luis Obispo	September 1, 1772
San Francisco de Asis	October 9, 1776
San Juan Capistrano	November 1, 1776
Santa Clara	January 12, 1777
San Buenaventura	March 31, 1782
Santa Barbara	December 4, 1786
La Purísima Concepcion	December 8, 1787
Santa Cruz	September 25, 1791
La Soledad	October 9, 1791
San José	June 11, 1797
San Juan Bautista	June 24, 1797
San Miguel	July 25, 1797
San Fernando	September 8, 1797
San Luis Rey	June 13, 1798
Santa Inéz	September 17, 1804
San Rafael Arcangel	December 18, 1817
San Francisco Solano	July 4, 1823

CITY AND COUNTY OF SANTA CRUZ.

"THE County of Santa Cruz is, emphatically, a county of pleasant homes,—a county in which any industrious man of moderate means can build himself a home. And the man who invests in Santa Cruz soil can rest certain that he will reap richer returns than did the hardy generation which upturned the soil in search of gold. On the gentle slopes of the mountains flourish the vineyard and the orchard; in the pleasant valleys, grain and grass and fruit yield abundantly; in the rich valley of the Pajaro the rancher coins the sugar beet into hard dollars; the gigantic redwoods keep busy the lumbermen of the hills; the magnificent water power drives the engines and lights the lamps of the city; the splendid quarries of lime and petroleum rock bring livelihoods to hundreds; and over all this scene of happiness and orderly, industrial content broods the bright sunshine, and softly blow the delicious breezes of the fairest, loveliest spot that ever slept and waked in the smile of God."

Pacific Avenue, City of Santa Cruz.

A FEW STATISTICS AND FACTS.

Santa Cruz has the most beautiful beach on the Pacific Coast.

Has unlimited electric power, generated by mountain streams.

City of Santa Cruz supplies water to consumers at a merely nominal rate—50 cents.

Lowest death rate.

Bitumen-paved streets, electric lights, electric cars, electric power for manufacturing establishments.

Has free postoffice delivery to all parts of Santa Cruz.

A natural sanitarium.

Largest beet-sugar factory in the world is located at Watsonville.

Has five daily newspapers.

The finest wines of native growth are made in the Santa Cruz Mountains.

The Pajaro Valley produces nearly forty per cent more to the acre of sugar beets than any other part of the United States.

The Ancient Mission of the Holy Cross.

Has seventy-four public and private schools.

The most solid banks in the whole State.

The greatest limestone and bituminous rock quarries, the greatest petroleum mines, the greatest redwood timber tracts, on the Pacific Coast. In 1896 over $63,000 paid out for hauling and mining bituminous rock.

One of the largest powder and dynamite works in the country.

Forty thousand acres of pasture land on which the grass is green all the year round.

The finest salmon fishing in the world.

The climate is the most equable in the world, having neither extreme of heat nor cold.

Has railroad and steamboat competition, and thus obtains freight rates far lower than any other county in California, thus giving the farmers cheap access to good markets, and making the value of a farm of 100 acres in Santa Cruz County, particularly in the vicinity of Watsonville, nearly three times the value of a similar farm anywhere else in the State.

The policy of the principal land owners is to subdivide and sell to actual settlers, and any man with a little means and no fear of work can make himself a home in Santa Cruz County.

Land can be obtained in small tracts—an impossibility in many parts of this State.

Families can live in comfort on the produce of chicken and fruit and vegetable ranches of from two to ten acres.

Santa Cruz has one of the best-equipped business colleges in the country.

Small tracts of land can be obtained on the most favorable terms and long time.

The northern part of the county furnishes the hunter the finest shooting in the State, the Big Basin being alive with game of all kinds.

All county roads built scientifically and sprinkled daily. The best county roads in the State, as certified by the State Road Commission.

Has six weekly newspapers.

Santa Cruz is the most picturesque city in California. The cottages of even the poorest are embowered in flowers, which bloom in profusion the whole year round.

THE CALIFORNIA MINERS' ASSOCIATION.

BY PRESIDENT J. H. NEFF.

Through the California Miners' Association, with its enthusiastic energy and co-operative determination, the mining industry in California has taken on new life, and its future outlook is more than ordinarily bright. The steady increase in the annual gold yield of our State is supplemented by renewed activity and increasing yields in other branches of mining to the extent that the eyes of the world are now turned upon California, and legitimate investors are making careful and earnest examination of the advantages here offered.

Before the formation of this association, the individual miner was left to his own resources. No matter how much cause of complaint he might have had, or under what injustice he might be suffering, his single-handed efforts before the courts, the Legislature, the land offices, or Congress, were scarcely heeded, and he could accomplish nothing. One man fighting for relief from obnoxious laws, or department rulings, and demanding a change, would not be recognized as representing an industry; but when all of the class identified with that industry band together in a common cause, and, through these representatives, demand relief, the department, the Legislature, and Congress itself, *must* listen to their appeals, and give consideration to their requests. Under these circumstances, the American people, who are more powerful than these bodies of their own creation, will make themselves heard where the cause is just, as was ours, and their influence materially aids in the accomplishment of the desired ends.

BRIEF HISTORY OF THE ASSOCIATION.

On the 18th day of November, 1891, the first meeting was held, and resulted in the Placer County Miners' Convention at Auburn, November 28th, to prepare for a State Convention to be held on January 20th, 1892.

Among other things, a committee was appointed to issue an address to the people of the State, calling attention to the deplorable condition of the mining industry, and the measures of relief desired.

After two days' work, the address was issued for publication in the newspapers. It was an appeal to the people of California, in behalf of the miners' cause, and had the effect of creating a favorable impression, which was borne out by the results of the State Convention.

At the first meeting held to consider the subject, there were only sixteen men in this great city who attended or paid any attention to the matter. Just think of it, gentlemen. In a State founded on its gold mines, in a great city built by the gold mines, filled with millionaires and merchants who had made their fortunes in mining, only sixteen men could be found at that time who were willing to come forward and lend their names and influence toward rehabilitating a branch of the industry fallen into decadence through adverse judicial decision, and which had formerly poured ten millions of dollars in new gold annually into the channels of trade in this city. Here was an investment of one hundred millions of dollars lying idle in our midst, unproductive, unused, and valueless.

But those who had the work in hand were not dismayed. As one who was appointed a delegate from San Francisco to the State Convention declined, or dropped aside, another was chosen in his place, until finally the full quota was obtained. In the mountains they were eager to come, and no man refused, for they realized all there was at stake.

Finally, on January 20th, 1892, the first State Convention of the miners of California was held in San Francisco, and was an overwhelming success. There was a complete revulsion of popular feeling.

When our first convention adjourned and we organized the California Miners' Association, we at once realized that we had the assistance and moral support of the people and the press of the State. We were given a backing far beyond what was even expected. The Chamber of Commerce, the Board of Trade, and Board of Supervisors of San Francisco, passed resolutions endorsing our memorial and our objects, as did the Boards of Supervisors throughout the interior counties. The merchants and manufacturers of this city were wonderfully liberal in their donations of needful money to carry on our work, and money came from other places as well. The different county miners' associations responded liberally to our call for financial help, and the California Miners' Association was fairly and successfully launched, with public favor enlisted in its behalf.

I undertake to say that no organization has ever accomplished such important results, with such small expenditures. No officer of the association has received one dollar from the treasury for professional services, nor has any one else connected with the management of its affairs.

As to the future of this association, I have every confidence in it. There are many measures which will be of benefit to the mining industry of the State which still demand consideration at its hands. Prominent among them are the needs of a representative of the mining industry in the councils of the nation, for there should be a Secretary of Mines in the Cabinet, that our large and growing interests might be better guarded. Moreover, closer at home, there should be in the State University, where there is already a college of mines and professors of mining, one or more representatives of the mining interests in the Board of Regents. It should continue to lend its moral support and influence to the maintenance of the State Mining Bureau, which is now doing useful work in behalf of the mining industry of the State.

The Mineral Lands Bill, which failed of passage at the last session of Congress, has been reintroduced and will come up for consideration at the next session in December. It can surely be passed if our members in the House of Representatives will take the matter in hand promptly. The appropriation of $250,000 by the State, and of another $250,000 by Congress, are now available, and will soon be expended in the improvement of the rivers, and the construction of dams to prevent further encroachments of débris now in the streams, upon the navigable portions. Many hydraulic mines are now being operated under the provisions of the Caminetti law, and their number is daily increasing. We have now a State Débris Commission, which is coöperating with the Federal Commission in the conduct of the work of rehabilitating these mines.

I have great faith in the future of the mining industry of California. This great industry is now advancing with rapid strides, and increasing its product between two and three millions of dollars every year. Those noble mountains which overlook our great valleys, and form the backbone of the State, are daily yielding their golden treasures to the enrichment of us all. More still remains hidden than has ever been taken out, and there is work for the sturdy miner for years to come. The blow of his pick will resound and reëcho through those grand old cañons and ravines long after all of us shall have passed from the scene of our labors.

NECESSITY FOR A NATIONAL DEPARTMENT OF MINES AND MINING.

By Hon. Tirey L. Ford.

The movement for the creation of a National Executive Department of Mines and Mining, begun a few years since by the California Miners' Association, has been taken up by other organizations in different parts of the country, and is now being strongly and seriously urged upon the members of our National Congress.

California, in common with this entire Western country, is especially and vitally interested in the movement, but not less so than should be the friends of the mining industry throughout the United States. In fact, it is a matter that should engage the thoughtful attention of all good citizens.

There exists at present no Executive Department of the National Government that renders any special aid to the mining industry, the lack of which is seriously felt and the need of which is growing annually more urgent. The State, Treasury and War Departments, established in 1789, supplemented by the Postal and Navy Departments in 1798, supplied the needs of that day. The Interior Department, created in 1849, had become a necessity, though no thought of the mining industry lay at the basis of its creation. To this department was entrusted the administration of all governmental affairs relating to the General Land Office, the Patent Office, the Indian Office, the Pension Office, the Census Office, the Bureau of Education, the Bureau of Railroads, the Geological Survey, and numerous other matters relating to the pressing needs of a rapid industrial development. No consideration, however, was given to the industry then of such little moment, but since grown to proportions of such stupendous character.

The lapse of half a century since the creation of the Interior Department has wrought a marvelous change. The population of our country has increased nearly four-fold, while its wealth has increased almost beyond the power of computation. Every portion of our Union has steadily advanced, but nowhere has there been such marvelous and astonishing rapidity of development as in this land beyond the Mississippi. The mythical "Far West" of fifty years ago has suddenly become the center of the world's industrial progress. Five sparsely settled States have increased to nineteen great commonwealths, with two more knocking at the doors of Congress for admission. A small and unheeded delegation in Congress has increased in numbers until it comprises more than one-third of the Senate and an influential portion of the House.

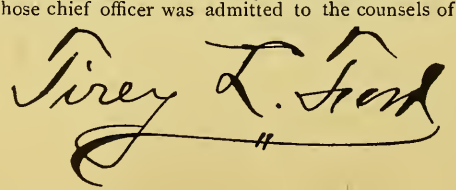
Nor has the mining industry lagged behind in the general advance. In fact, it has led the grand industrial march and stands without a parallel in the rapidity of its growth and development. The annual yield of coal has increased from less than 4,000,000 tons in 1849 to nearly 187,000,000 tons in 1896. Iron has increased from 600,000 tons in 1850 to over 15,000,000 tons in 1896. Lead has increased from 18,000 to 175,000 tons, and copper from less than 1,000 to over 212,000 tons. And so it has been throughout the long list of the mineral products of America. The precious metals tell an equally marvelous story. The annual gold yield has advanced from less than $5,000,000 in 1848 to nearly $53,000,000 in 1896, with the virgin gold fields of Utah and Colorado and other Western States, supplemented by the prospective yield from far-off Alaska, ready to still further augment this enormous output. The production of silver in commercial quantities began with the memory of the present generation, yet its output in 1895 was over $70,000,000, from mines that were seemingly inexhaustible. When we come to view the mining industry as a whole our amazement becomes intense and statistics grow bewildering. From an annual yield of fifty years ago so modest that the public mind scarce gave it a thought, the mineral production of the United States has mounted up into the hundreds of millions, and is rapidly nearing the billion-dollar mark. In no other industry has there been such rapidity of development and growth, in no other industry are future possibilities greater. When other industries have declined, mining has steadily advanced. It has been the mainstay of hard times and the balance-wheel of industrial energy. It has quickened every avenue of trade and raised our Nation to a degree of independence not otherwise attainable. It is equally the hand-maid of factory and of farm, while without it commerce would be bereft of its safest friend and surest ally. Nor is this all. It is to the credit of the mining industry that in the hour of our Nation's darkest peril, her waning credit was sustained by the enormous yield from the gold mines of California.

Our Government can well afford to aid and encourage an industry that has done so much and upon which the future prosperity of our Nation so largely depends. But how shall this aid be extended. The first consideration is unity of action, a system with one controlling head from which uniformity of results may follow. The Mining Bureaus of the several States accomplish much good, and are valuable adjuncts in the development of the mining industry and the promotion of mining interests in general. Their respective fields of labor, however, are bounded by State lines, and united action, under such conditions, can scarcely be expected. No efficient means for interchange of methods or results can be devised without some common source to which alike may go those having or desiring information. Only by means of a National Bureau can these requirements be fulfilled, and a complete and harmonious system be evolved from the present incomplete and isolated systems of the several States.

Nor should the work thus briefly indicated be left to a subordinate branch of any existing department. This, in fact, is one of the evils of the present system. The Treasury Department, it is true, furnishes statistical information of some value, and the Interior Department is supposed to render some occasional aid; but neither the Secretary of the Treasury nor the Secretary of the Interior can, in the very nature of things, devote the attention to the mining industry which its importance deserves. The Secretary of the Treasury is sufficiently engaged with problems of finance and the collection and disbursement of the vast revenues of the Government, while the Secretary of the Interior is overwhelmed with questions relating to the public lands, patents for inventions, Indian affairs, pensions, the census, and a hundred other subjects of but little less importance. The stupendous proportions to which the business of the Interior Department has grown renders it absolutely impossible for the head of that department to even acquaint himself with the needs of the mining industry.

It is clear that the bureau sought to be established should have at its head a member of the President's Cabinet who would at once have the ear of Congress and the confidence of the President. The importance of the mining industry demands that the Nation's Chief Executive should at all times be able to command the fullest and best information relating to its needs, and in no way could this be so well accomplished as through an Executive Department whose chief officer was admitted to the counsels of the President's official family.

San Francisco, Nov. 19, 1897.



SANTA MONICA,

FOR VISITOR OR HOME-SEEKER.

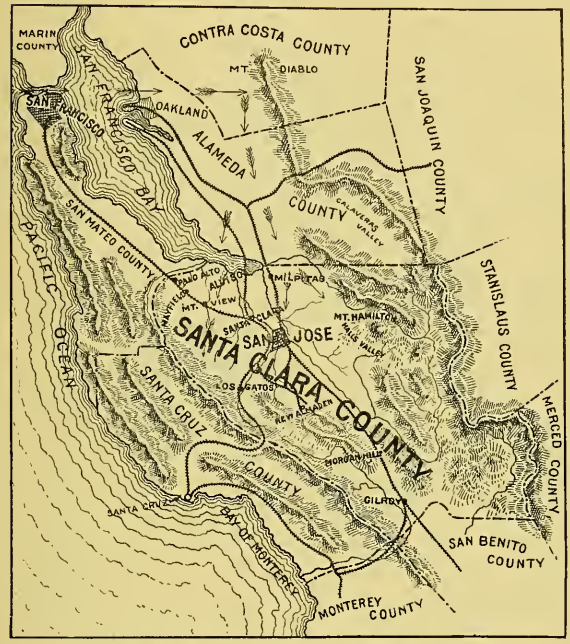
Warmed by a southern sun and freshened by the fanning of the ocean's breezes, Santa Monica, the gem of the Coast, enthralls the visitor. He comes again and again, and finally transfers his household gods to this Pacific town and settles down in peace and contentment. The town is not sleepy, but if you want to drowse you may do so at any time of the year lying on the golden sands of the beach. If you want a taste of the goodfellowship and bustle of town or city life, you will find both right here in Santa Monica and but a half hour's ride to Los Angeles. The streets are well kept and beautiful, and Ocean Avenue, skirting the beach for several miles, is noted as one of the finest drives in the country. Many wealthy and noted people have lovely, picturesque residences here, and all the year round society finds its entertainment. As the temperature is delightfully equable, out-of-door sports may be enjoyed winter or summer, and surf bathing is safe and pleasant at almost any time of the year. The North Beach Bath House is splendidly equipped, and tanks where you can enjoy a warm or cold swim are renewed with salt sea water every day. The electric cars run from Los Angeles every half hour until midnight, and the Southern Pacific Fe each give splendid service. In the large pavilion, fish dinners are served at all seasons, and they have become noted throughout the West for their excellence. The Hotel Arcadia, built upon the very edge of the mesa overhanging the beach, is delightful in its environment and charming in its hospitality. The cottage homes, which are perennial rose bowers with their cypress hedges and semi-tropical shade trees, are one of the chief delights of the place. The town is growing in a steady, solid way, and property is rapidly increasing in value. There are two important business streets, electric lights, good fire service, and all the improvements of modern times. At the mammoth wharf all is bustle and noise with the arrival and departure of passengers and freight, and yet a few rods walk will bring you into a bosky cañon where you are as removed from the world, to all appearances, as though in the heart of the Rockies. There are a number of these cool, fern-carpeted cañons in the surrounding hills, and here the young people indulge at any time in the old-fashioned picnic or in a dance on a moonlight night. The Chamber of Commerce of Santa Monica has issued an artistic booklet, which all inquirers are welcome to.

SANTA CLARA COUNTY.

Area, 1,754 Square Miles. Unequaled in the World for the Variety and Extent of its Products.

The Granary and the Garden of the world.
The Land of Sunshine, Fruit and Flowers.

SAN JOSE AND VICINITY.



NOTE THE LOCATION OF SAN JOSE.

FACTS ABOUT SANTA CLARA CO.

Santa Clara Co. has 111 miles of railroad.

Santa Clara Co. contains 1,754 sq. miles.

Over $1,300 an acre have been netted in one year on Santa Clara County cherries.

The annual expenditure for road purposes in Santa Clara County exceeds $100,000.

Number of horses in Santa Clara Co., 16,624; cattle, 25,197; sheep, 2,972; hogs, 3,742.

Santa Clara County has the largest University,—Stanford,—with an endowment of $15,000,000.

The assessed quantity of wines and brandies in Santa Clara County for 1895 was 1,991,600 gallons.

No other section of the world produces the varieties of fruit that are grown in Santa Clara County.

In Santa Clara County there is not a month during the year when fruit of some kind does not ripen.

Santa Clara County has the lowest rate of taxation of any county in California save one—Yolo County.

Santa Clara County products will average, of the same area per acre, the highest of any products in the world

Santa Clara County not only produces the most fruit, but is the greatest wine-producing county in California.

The prune output of Santa Clara County is nearly three times greater than the entire product of America, all the remainder of California included.

Santa Clara County has more elegant residences, more beautiful country homes, more county wealth per capita, than any other county in California.

The value of Santa Clara County's public property is $935,650. Its bonded indebtedness is but $144,500. It thus has over $7.00 in property for every $1.00 it owes. Its average annual interest is 4½ per cent.

TWO OF THE MEN WHO HAVE HELPED TO MAKE SAN JOSE.

The oldest and most influential newspaper published in San Jose is the *Daily Mercury*, owned and edited by Chas. M. Shortridge. Since he obtained control of it the improvements have been constant, until it has become a thoroughly up-to-date newspaper, well equipped in all its departments and completely in accord with the progressive spirit of the day. While keeping in close touch with the vital questions of the hour, State and National, the *Mercury*, under Mr. Shortridge's management, has devoted special attention to local interests, and, on account of the enterprising stand it has taken upon all subjects tending to further the prosperity of the city, has become a potent factor in molding public opinion.

In recognition of his services in the cause of Republicanism, both in the editorial columns of his newspaper and on the stump, the many friends of Mr. Shortridge have urged him to become an aspirant for the Congressional nomination. As his public spiritedness and geniality have made him popular among all classes and parties, it is safe to assume that a nomination will be equivalent to an election.

The largest mercantile establishment in San Jose, and one of the largest in California, occupies about a quarter of a long block, with entrances on three streets. It is owned by O. A. Hale & Co., a fim that controls and operates a series of stores extending from Sacramento and San Francisco to Los Angeles. The President of the company is O. A. Hale, one of the shrewdest and most progressive business men on the Coast. He has unlimited faith in San Jose, and every important scheme for public improvement has found him a zealous and influential advocate. Mr. Hale was recently reappointed one of the trustees for the California Hospital for the Insane at Agnews. In making a nonpartisan selection Governor Budd cast about for a thoroughly representative citizen and found such a one in O. A. Hale.

Chas. M. Shortridge.

FERTILE LANDS OF SACRAMENTO COUNTY

Sacramento County HAS 619,520 acres of land, all good productive soil and not to be excelled by that of any other county in the State. In every part of the county are to be found citrus and deciduous fruits, nuts, grains and vegetables, and occasionally the date, banana and palm trees. All seem to prosper. The lands along the Sacramento, American and Cosumnes rivers are deep, rich black loam, commonly called bottom land. As a rule, adjoining the bottom lands are second bottom lands, a deep, rich sandy loam. Then come the plains lands, which are not always deep soil, but which are very rich and fertile. Next follow the rolling lands. All of this hill land is good, and the greater portion is a deep gravel loam, reddish and of excellent quality.

The bottom lands yield enormous and profitable crops of oranges, peaches, pears, prunes, cherries, beans, common and sweet potatoes, vegetables of all kinds, hops, alfalfa, etc. The second bottom lands are producing very profitable crops of apricots, peaches, oranges, lemons, grapes, raisins, nuts of all kinds, strawberries, raspberries and blackberries. The French prune and plum do well on this land. The plains lands are better adapted to peaches, berries and grapes, and in some cases the olive, orange, lemon and other similar fruits are very profitable. The rolling or hill lands are especially adapted to the growth of the olive. Wherever an olive tree has been planted on these lands, it has always thriven without the aid of irrigation; but, like other trees, it must have good cultivation and care if you wish it to bring large returns. The fig, orange and lemon give very handsome returns, but the orange and lemon must be irrigated. The almond and the apricot are regular and profitable bearers on this land. Light irrigation helps them. These rolling lands are among the most valuable in the county. They are warm and productive; water for irrigating purposes can be brought to them at a very low cost; the soil is deep and good, and very productive when irrigated. For years much of them have been used for pasturing sheep and cattle, and are now in prime condition for the fruit grower. This land is held at from $10 to $30 per acre.

According to the latest statistics, there are over 14,000 acres of trees and vineyards in this county,— 12,000 acres in bearing and 2,000 acres not yet in bearing. The annual green fruit product is about 90,000,000 pounds. Of all the fruits, peaches lead in acreage and production; then in order come pears, grapes, prunes, plums, apricots, almonds, oranges, cherries, figs and olives. Immense amounts of strawberries, raspberries and blackberries are grown around Sacramento. This county produces about two-thirds of the Eastern deciduous fruit shipments of the State.

The reclamation of lands from the floods of the Sacramento River has progressed to an extent which would require a volume to describe. The immense pumping, ditching and dredging plants are models for the world. Some of the richest of these districts are within the limits of Sacramento County, and all are within the area of the trade of the City of Sacramento. Tests have been made, and it has been demonstrated that 100,000 acres in Sacramento County are adapted to growing sugar beets, one-half of which is available. Proposals for building a sugar beet factory and refinery of capacity requiring the planting of 10,000 acres are now going on.

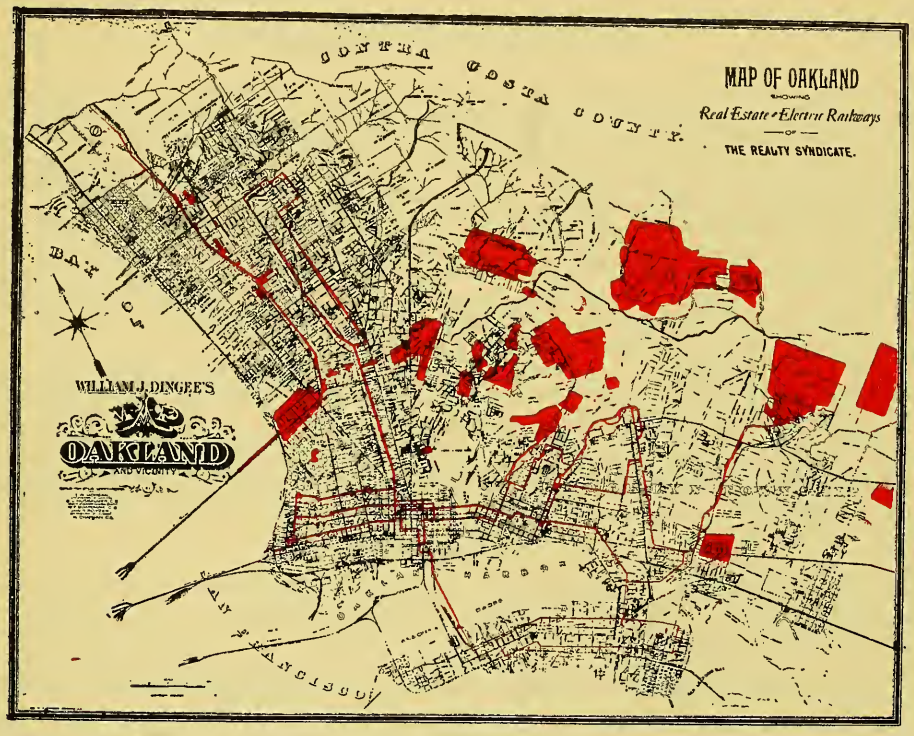
City of Sacramento The transportation and commercial advantages of Sacramento can be seen and fully appreciated by a few minutes inspection of a map of California. SACRAMENTO, the capital of the State, is a center for railways, and is located on the Sacramento, the principal river of California. The shipments to the East are larger than from any other point, excepting San Francisco.

Electric lines convey the results of water power into the city from two never-failing falls. From Folsom, twenty-two miles distant, at present 2,000 horse-power is obtained, which will be trebled soon. From Newcastle, twenty-eight miles distant, 800 horse-power is obtained, which will also be trebled. The Gas Company has a steam electric plant of 1,500 horse-power.

Further Information on Sacramento may be had by applying to the **Sacramento Chamber of Commerce**

THE REALTY SYNDICATE....

14 SANSOME STREET,
San Francisco, Cal.



STATEMENT.

ASSETS—Sept. 30	1895	1896	1897
Real Estate,	$921,528.00	$1,100,629.31	$1,547,381.50
Stocks and Bonds,	. . . . .	803,934.24	1,414,244.28
Bills Receivable,	59,924.00	140,982.69	150,411.40
Office Furniture,	. . . . .	752.25	1,376.87
Cash in Banks and Office,	20,000.00	24,693.79	33,723.92
	$1,001,452.00	$2,070,992.28	$3,147,137.97
LIABILITIES—			
Received from Investors,	. . . . .	$ 198,619.93	$ 694,738.87
Mortgages,	$201,294.00	229,974.00	301,528.00
Bills Payable,	5,534.00	173,516.77	318,321.11
Capital Stock Paid In,	714,700.00	1,358,350.00	1,610,350.00
Surplus,	79,924.00	120,531.58	222,199.99
	$1,001,452.00	$2,070,992.28	$3,147,137.97

Principal Capital Stockholders.

FRANK M. SMITH, . . . Pres. Pacific Coast Borax Co.
W. H. MARTIN, ... Capitalist, Ballard & Martin
H. C. MINER, ... Miner's Theatres, New York
WM. G. HENSHAW, . . Vice-Pres. Union Savings Bank
WM. J. DINGEE, ... Pres. The Oakland Water Co.
J. C. WINANS, ... Manufacturer, 220 Fremont St.
F. C. HAVENS, ... Vice-President
W. FRANK PIERCE, Pres. Blue Lakes Water Co., S. F.
D. D. HARRIS, ... Merchant
C. A. MURDOCK, ... C. A. Murdock & Co.
C. E. TINKHAM, ... Supt. Sierra Lumber Co.
E. A. HERON, ... Real Estate
L. G. HARRIER, ... City Attorney, Vallejo
GEO. L. NUSBAUMER, . . Co. Survevor, Alameda Co.
DELOS PALMER, ... Capitalist, New York
CHARLES CAMDEN, ... Capitalist, Oakland

THE PROPERTIES OWNED by THE REALTY SYNDICATE include every element of value that secures to real estate the features distinguishing investment from speculation, to wit: LOCATION in the natural and necessary line of residence growth of a large city. LARGE TRACTS, suited to subdivision for retail buyers, thereby securing the wholesaler's profit. LOW COST, purchased at the most favorable time, at a cash valuation below the market. CONTROL OF TRANSIT FACILITIES, consisting of the ownership of electric roads, the most effective means of enhancing the values of suburban property. They were purchased at a phenomenally low cash cost in 1895 and 1896, offering in a future legitimate growth in values a margin of profit unequaled in the realty market of any city. Preferred Share Certificates are issued by THE REALTY SYNDICATE for any amount from $100 to $10,000, payable in one sum or in installments in advance.

An investor with THE REALTY SYNDICATE is not a capital stockholder, and is free from any liability.

SEND MONEY TO CORPORATION BY CHECK OR MONEY ORDER.

THE

Pacific Mutual Life Insurance Company.

A PRODUCT OF CALIFORNIA.

Twenty-nine years ago a number of the leading business men of California incorporated The Pacific Mutual Life Insurance Company. The late Senator Stanford became its first President and held its Policy No. 1. From the beginning success attended The Pacific Mutual, and the Company soon gained recognition as one of the leading financial institutions of the Pacific Coast. This position has been well maintained, as indicated by its last Annual Statement, January 1, 1897, which showed assets of **$3,083,000**, while its payments on policy-holders' account then exceeded **$8,500,000.**

The Pacific Mutual has its home office in the Company's own building, northeast corner Montgomery and Sacramento Streets, San Francisco, and is established in twenty-four States. Its popularity is attested by its income for the year **1896**, which was **$1,077,045**. Regardless of the financial depression of the past few years, The Pacific Mutual made steady progress. In the year **1896** it added **$150,000** to its assets, while marked increase was made in surplus, premium receipts, interest receipts, payments to policy-holders, insurance written and paid for, and insurance in force.

The Company's policies are unequaled for liberality of terms and conditions. They embrace every feature that goes to make up a perfect contract of insurance. In no essential are they wanting. They are recognized as the best that can be produced for the policy-holder with due regard for safety.

The Directors of the Company, whose names are appended, are well-known business men of California, whose knowledge of and experience in the business tend to best possible results for the policy-holders. This, combined with the security afforded by the stringent insurance laws of California and the legal organization of the Company, gives advantages unexcelled by any other Company, and makes a policy in The Pacific Mutual the peer of any.

DIRECTORS.

GEO. W. BEAVER, Capitalist. W. H. CROCKER, Pres. Crocker-Woolworth Nat. Bank. W. R. CLUNESS, Physician.
L. P. DREXLER, Capitalist. JAMES CAROLAN, Retired Merchant. J. F. HOUGHTON, Capitalist.
JAMES IRVINE, Capitalist. D. W. EARL, Forwarding and Commission Merchant. HUGH M. LARUE, Capitalist.
WM. R. SHERWOOD, Capitalist. CHAS. N. FOX, Attorney-at-Law.
SAMUEL LAVENSON, Locke & Lavenson. GEO. A. MOORE, President of the Company.
GEO. W. SCOTT, Scott & Van Arsdale. HENRY T. SCOTT, Pres. Union Iron Works.

BEND COLONY, Tehama County, Cal.

WINTERLESS CLIMATE; MOUNTAIN SCENERY; PROLIFIC SOIL; ABUNDANCE OF WATER; CHEAP FUEL; COMFORT, HEALTH AND HAPPINESS.

Located in the very center of one of the most beautiful semi-tropic valleys in the world. Second in size and first in fertility of all on the Pacific Coast. Its scenery is magnificent and awe-inspiring in its grandeur.

Though ever in sight of the seven-thousand-foot snow cap, reared fourteen thousand feet aloft by mighty Shasta, the beautiful valley has a winterless climate of Southern California.

Popular resorts are within and around it. Game is plentiful and fishing good.

The great horseshoe bend of the Sacramento River gives it a name and bounds three sides of the tract of about three square miles upon which it is built.

Its bottom lands are a rich, black, sandy loam, twelve to thirty feet deep, underlaid with a stratum of gravel, yielding pure, cool water. Another soil is that reddish, decomposed granite, so very prolific in California for citrus fruits.

Throughout this State irrigation is essential. Ample water has a great value; abundance for irrigation has been provided under a model system, and is deeded with the land in quantities sufficient for all purposes and no rental.

Here alfalfa, best of all forage plants, grows luxuriantly, yielding three or four crops per year, with a ready market of from $8 to $12 per ton. Wheat, one of the main crops of the valley, yields twenty-five bushels to the acre, barley and oats about thirty. Potatoes, tobacco and grapes grow wonderfully.

The largest single vineyard in the world is only a few miles away. Both land and climate are perfectly adapted to all kinds of deciduous fruits and nuts. Orange, lemon and fig do admirably. The orange matures from four to six weeks earlier than in Southern California.

This Colony is five miles from the railroad and county-seat, which is a thriving town of four thousand progressive population. Many families are already settled in the Colony; all have orchards, gardens and stock. A good school and postoffice are maintained in the center of the tract.

Timber is plentiful and very cheap. Malaria is unknown. The locality, in short, is truly ideal for the upbuilding of a home where comfort, health and happiness are the objects desired.

For further descriptive matter, prices and terms, address

McCOLLOUGH & BROKAW, OWNERS, RED BLUFF, CAL.

CAPITOLA-BY-THE-SEA.

BY ISABEL H. RAYMOND.

The shores of Monterey Bay present the most perfect combination of charming and equable winter climate, picturesque varied scenery, and opportunities for delightful diversion of any portion of California. And search, if you will, every mile of the curving shore of the bay, with its fine mountains in the background, and no more beautiful spot will be found than Capitola, the little resort which nestles by the bay and climbs up over the cliffs along whose grassy downs the pretty cottages are scattered. The yellow curve of the bathing beach, where on every sunny winter day the surf can be enjoyed, is broken by the mouth of Soquel Creek, where boating and trout fishing are the attractions.

Hotel Capitola.

There are hot and cold salt water baths under cover if you choose. There are sailing and salmon fishing, besides the taking of a score of other sorts on the bay, with the Santa Lucia, El Gabilan and Santa Cruz mountains filling the horizon.

There are charming country and seaside walks and a hundred miles of the finest drives in the world—forest, mountain and coast.

The temperature is wonderfully equable—winter average of mercury 52 degrees above zero, only 10 degrees lower than summer average; no snow; heliotrope, carnations and roses blossom all winter out-of-doors.

Hotel Capitola, situated at the edge of the bay, is the handsomest and most delightful resort in the State. Ample accommodations for six hundred guests; sunny suites with bath; single rooms finely furnished; large and handsome office, big fireplaces, electric lights; glass-covered porch; fine glass club house, built into cliff and right over the water, with a roof garden of tropical plants; ball room, with stage for concerts and theatricals; elegant drawing room; handsomest dining room in the world—every table looks out on the bay. Messrs. Hepburn & Terry, proprietors. Telegraph, telephone, express, postoffice, money order, livery stable and all conveniences. Table and cuisine under charge of that famed chef, Hepburn.

Capitola connects by two trains each way daily from San Francisco, also with the city of Santa Cruz, five miles distant, and by steamer from all coast cities.

PACIFIC OCEAN HOUSE.

E. B. PIXLEY, PROPRIETOR.

Pacific Ocean House

Is the first-class hotel located on the principal avenue of the beautiful City of Santa Cruz on Monterey Bay. Three stories in height, with pleasant rooms and suites, handsome office, elevator, excellent table, and every comfort required by travelers and visitors. An exceptional charm is lent to this hostelry by the cheery presence of Mrs. Pixley and her daughters, who devote themselves to the comfort and pleasure of guests.

Santa Cruz is famed for its picturesque situation and environment, fine winter climate, many flower gardens, abloom all winter, good pavements and sidewalks; magnificent drives and walks in all directions; unique and magnificent grove of big trees, only five miles distant; ample livery accommodations. Connects by two railways, broad and narrow gauge, with San Francisco, all the way through fine scenery. Coast steamers southward and northward. A lovely and beautiful winter home.

Pacific Congress Springs.

Located in the foothills of the Santa Cruz Mountains, 800 feet above the sea, sheltered from winds and away from fogs. The famous orchards and vineyards of the Santa Clara Valley are on one side, the vineclad foothills and forest-covered mountains on the other.

California's most perfect climate; no mosquitoes or other pests.

The hotel is comfortable, modern and well kept. The springs yield the best mineral water in California, either for drinking or bathing.

Easy of access; only two and one-half hours from San Francisco or Oakland; one hour from San Jose.

Carriages meet trains at Los Gatos.

OPEN ALL THE YEAR ROUND.

For further information, printed matter, etc., address

JOHN S. MATHESON, Manager.

Pacific Congress Springs, Santa Clara Co., Cal.

THE WOMAN'S NORTHWEST MINING & INVESTMENT ASSOCIATION.

Home Office: Van Valkenberg Block, SPOKANE, WASH. **San Francisco Office: Rooms 66-67, 120 Sutter Street.**

ORRILLA BERTRAND, *President.* ANNA MAY KEISER, *Gen. Manager.* WALTRINE WILLIS, *Asst. Manager.* MARY A. DAVIS, *Vice-President.*

The Woman's Northwest Mining & Investment Association is an enterprise worthy of the incoming century. It was incorporated in the City of Spokane, Wash., December 3, 1896, under the laws of the State of Washington and British Columbia, for the purpose of buying, selling and developing mines.

The Officers and Trustees of the Association are as follows: Orrilla Bertrand, the President and Treasurer of the Association, has a practical knowledge of mining, having lived many years in mining camps. For the two terms for which her husband was elected as Treasurer of the City of Spokane, she was deputized to fill the duties of that office, which she did to the entire satisfaction of the public. Like the other ladies of the Association she is popular in social circles, and has a high sense of honor. Mary A. Davis, the Vice-President of the Association, is a lady of great force of character and business insight, has had a wide business experience, and being conversant with everything pertaining to practical mining her services will be invaluable to the Association. She is the wife of one of Spokane's most prominent business men.

Anna May Keiser, the General Manager and Assistant Treasurer of the Association, is the leading spirit of the enterprise. Being a shrewd young business woman of great perseveranee and push, and having a thorough knowledge of the business she has taken, she is the right person in the right place. She was formerly a Chicago lady, and has had considerable experience at newspaper work.

Florenee N. Kent, the Secretary of the Association, is a young woman of unusual force. She has for a number of years been engaged as Principal of the Bryant School in Spokane, Wash.

Waltrine Willis, the Assistant Manager and Assistant Secretary of the Association, is a woman of marked ability and wide business experience. She will accompany her husband to the Klondyke District, early in March, in the interests of the Association. As her husband, who is a successful mining man, will go with a large party of prospectors in his charge, she will have exceptional opportunities for getting the Association in on the ground floor if any strikes are made.

With such a force of capable women in charge, the success of the enterprise is assured. The Association has already bought properties in the Kootenai District, B. C., and in the Libby District, Montana, which it has proceeded to develop with the view of making them dividend payers in the near future. The head office of the Association is located in Spokane, Wash.

The Association has also an office in San Francisco, Cal., which is devoted to the bonding and selling of mines. This office is in charge of the General Manager. This branch of the business is proving profitable, and some of the finest paying properties have been placed in their hands, because of their excellent standing with capitalists and investors, both in this country and Europe. The mines of the Association will soon be on a paying basis, at which time the treasury stock will all be retired from the market. A limited amount of treasury stock can now be secured, and anyone desiring a safe and profitable investment would do well to call at its office or send for a prospectus soon. The investment is rendered doubly safe from the fact that every investor has an interest in every property owned or to be acquired by the Association; hence, should one property be disappointing, it can be made up in another, and no loss felt.

All stock in the Association is absolutely nonassessable, by reason of the British Columbia laws. The properties owned by the Association were purchased with money subscribed by the incorporators.

The business of the Association will be conducted on principles, which, if more generally adopted, the mining industry would speedily be restored to the place it deserves in public esteem, as one of the noblest of our industries.

S. C. BIGELOW, President
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THIS favorite watering place, summer resort and mountain Spa, still maintains its supremacy as the leading health and pleasure resort of the Pacific Coast. It is the most healthful of our pleasure abodes. This was officially determined and declared by the commission of learned doctors appointed by the Legislature of California to select a suitable locality for the erection of a State Hospital for Consumptives. This body of medical savants consumed two years in their investigations. They examined every portion of the State, east and west and from the northern line to the southern boundary. They took into consideration all the elements that affect the lungs—dryness and humidity of the atmosphere, its rarity and density, heat and cold. After having given all points due consideration, they finally reported in favor of the neighborhood of Napa Soda Springs, on the East Napa Range. The mean temperature of that point for July is 74 degrees, and for January 54 degrees. These designations are considered the best in the State for consumptive patients or those afflicted with bronchial, asthmatic or other pulmonary complaints.

An admitted medical authority on health, in pointing out the "Best Climate for Invalids in California," says: "So far as statistics are obtainable here, we can safely say that the mountain ridge east of Napa Valley—it may be called the East Napa Range—is unparalleled in the combination of dryness of the atmosphere, with mildness and equability of temperature, and fitness for camping and spending the greater part of the year in the open air. From one thousand to fifteen hundred feet above the sea is the most desirable altitude. We believe that *no other part of the globe equals the East Napa Ridge as a resort for consumptives.*"

The waters of these springs have been on the market for thirty-five years, and during all that time have been freely used by the most successful physicians in the sick room, who unhesitatingly give their willing testimony in its behalf.

From a late number of the *Pacific Medical Journal* we take the following: "As an auxiliary to proper medical treatment in gastric catarrh, torpidity of the bowels, kidney and bladder disorders, anæmia, etc , etc., as well as a refreshing wholesome table water, nothing on earth excels Napa Soda."

Nothing has been forgotten to give pleasure and comfort to the guests. Winding paths lead with gentle grade to waterfalls and commanding peaks; cozy retreats invite to their grateful shade; lawn tennis and croquet grounds tempt the gallant beaux and belles; swings serve the children, and a band of trained "burros" (donkeys) just set the young masters and misses wild with their delightful abandon.

A new swimming pool, with naturally-heated water, adds its tempting luxury to the other attractions.

On the whole, there is no place on the Pacific Coast that offers more inducements for a visit than Napa Soda Springs.

Address **NAPA SODA SPRINGS,**

Napa County, California.

REDONDO BEACH, CAL.

It is acknowledged by all that this year-round resort possesses natural attractions which are unexcelled on the Pacific Coast.

Situated on a horseshoe bay, from whence the name Redondo (round) is derived, the magnificent hotel which bears that name commands a view of the Pacific with its busy shipping and fishing scenes on the one hand, while the promontories known as Point Dumas and Point Vincent bound the view to the north and south, and the beautiful San Gabriel Valley extends out to the eastward. The rolling contour of Redondo gives to it a distinctive charm which applies to no other resort on this Coast. For, rising in terraces from the water's edge, every location is sightly, and the general effect is most ideal for a pleasure resort by the sea.

While Redondo Beach is young in years, it has gained the general favor of the élite of Los Angeles, who tax the capacity of the great hotel in the summer months. None have visited Hotel Redondo but to sing its praise, and the many who return each year to enjoy its sundry attractions bear evidence of its real merits. *** THE CLIMATE OF REDONDO IS UNSURPASSED IN THE ENTIRE WORLD, and its advantages of location have destined this beach to become, under ordinary conditions, the "NEWPORT" of the Pacific Coast as well as the principal shipping point for Southern California.

The peculiar formation of the water front, a deep submarine canyon heading at Redondo, gives to the place remarkable commercial advantages which are fast bringing it into prominence before the shipping world. Two lines of railroad, the Southern California Railway (Santa Fé) and Los Angeles & Redondo Railway, run from the wharves to Los Angeles and connect with all points in the interior and the East. Surrounded by every comfort known to first-class modern hostelries, guests of the Redondo Hotel, within an hour's ride of Los Angeles (the second city on the Coast), can enjoy absolute quiet and contentment, or profit by the various forms of amusement that are at hand. One of the largest warm salt water swimming tanks on the Coast and a beautiful beach for surf bathing attract many at all times of the year who are fond of aquatic sports. And fishing, boating, riding and driving, and tennis on the finest court in the State, contribute to the many forms of recreation that are enjoyed by visitors to this resort. To the lovers of flowers, ten acres of carnations at Redondo are a sight well worth the seeing. This favorite flower reaches its utmost perfection in the soil of Redondo, and cut flowers and plants shipped from its gardens to all points in the United States have established the superiority and reputation of "Redondo Carnations."

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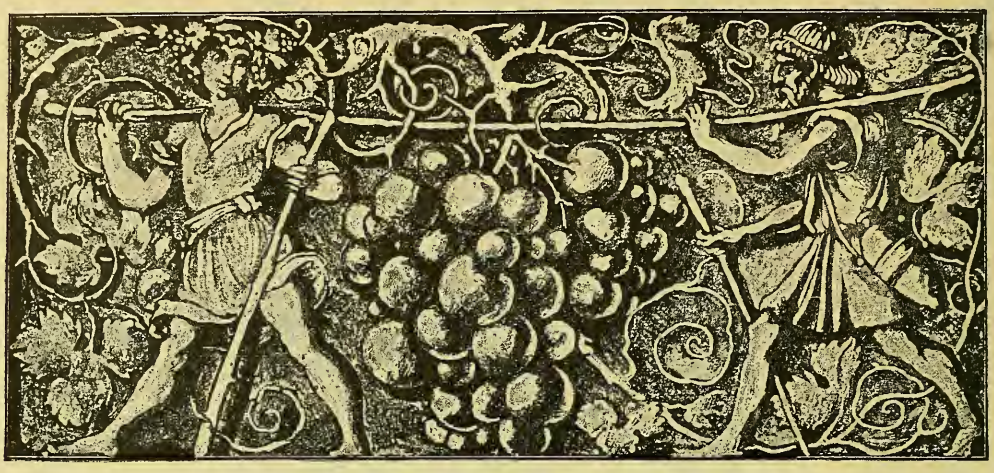

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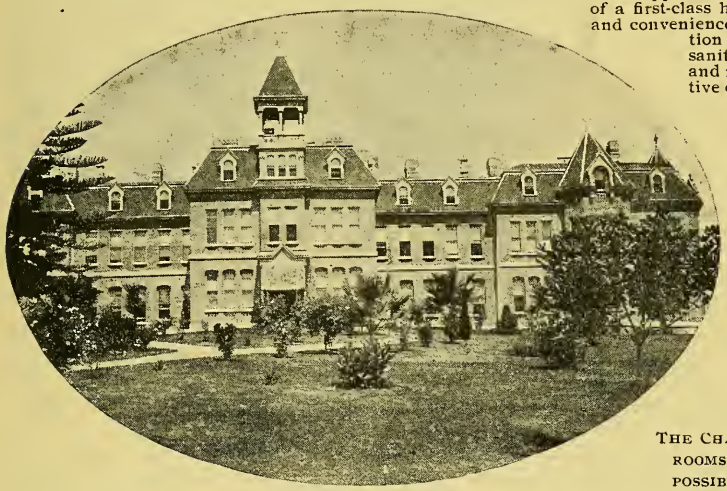

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STRICTLY FIRST CLASS

The reader is cheerfully referred to the foregoing pages for the most helpful information that has ever been published concerning California. The State's ablest writers in the several departments represented have given the subjects discussed their best thought, and the result is a wonderful wealth of knowledge in condensed and convenient form.

But the serious side only is painted; and, as pleasure must be a part of every well-ordered life, attention is invited to the following few paragraphs as welcome hints of what the State affords of an unusual character to please and entertain.

Yosemite Valley is a stupendous and picturesque chasm in the heart of the Sierra Nevada, due east from San Francisco by air line about 155 miles. Its base is the tortuous bed of the Merced River, about six miles long and varying in width from one-quarter to three-quarters of a mile. The features that make it so wonderful and have earned its world-wide fame are its bold and irregular granite walls, rising abruptly almost vertically one-half to three-quarters of a mile, and assuming inconceivably picturesque forms. Numberless cataracts, some plunging from dizzy heights of 3,000 feet, in many places a heavy forest growth, everywhere the luxuriant flora of the Sierras, are Nature's matchless adornment that complete a scene of indescribable grandeur and charm.

The touring season opens in April and closes in October. Distance from San Francisco, 188 miles by rail and 63 miles by stage. Time of trip going, about 45 hours. Not less than four days should be taken for the round trip. Pullman sleeper from San Francisco daily during the season. Hotel accommodations in the valley and en route ample.

A distinguished cosmopolitan once writing of California thus expressed his admiration of one of its famous attractions: "See all you can, but if your limit is to be one thing only, let that be Monterey and the Hotel del Monte." Whether all will agree with him or not may depend upon taste, but a visit there will remove all doubt as to the cause of his enthusiasm. Experienced globetrotters from all parts of the world have unhesitatingly proclaimed it the most beautiful and charming place in the world.

The trip is four hours' ride from San Francisco, and, if made to include Stanford University, the Garden City of San Jose, Mount Hamilton and the Lick Observatory, Monterey, Pacific Grove, the noted eighteen-mile drive, and, on return, pretty Santa Cruz, the Big Trees and the Santa Cruz Mountains, will be one of the most absorbingly interesting short trips on record.

The noted **Shasta Route,** connecting by rail the two prominent Pacific Coast cities, San Francisco and Portland, ranks foremost among the world's scenic lines. From the head of the Sacramento Valley northward more than 200 miles is a startling exhibition of skill and daring in railroad construction, and the rugged country which makes it so furnishes the sublime spectacle of mountain scenery that has made it famous.

Trains are run so that this portion of the line is passed by daylight, and during that season of the year when out-of-door travel is comfortable and inviting. Observation cars with open sides are furnished. Every minute from dawn till dark reveals some charming or startling scene.

The road passes around the western base of **Mount Shasta,** one of America's most interesting mountain peaks, and throughout the day the awful majesty of its cloud-piercing, snow-crowned dome dominates the scene.

Many beautiful resorts are scattered along the line, among them a number of favored camping grounds. Sweet Brier, Shasta Retreat, Shasta Springs, and Mt. Shasta Camp, right in the heart of Shasta's most rugged fastnesses, afford delightful accommodations for camping. Freedom of health-giving outdoor life, and endless variety of recreation, have made them widely popular. Bailey's, Dunsmuir, Upper Soda Springs and Sisson have cozy hotels, a bountiful board and all the home comforts.

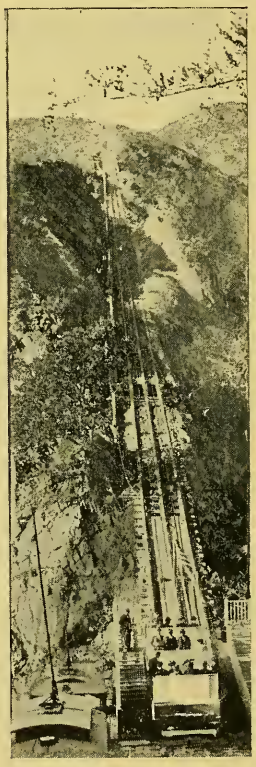
Foremost among the popular resorts of the great Shasta Region is the **Tavern of Castle Crag.** It is 320 miles north of San Francisco and is gracefully situated on a picturesque wooded plateau just under the brow of the frowning, battlemented cliffs from which it takes its name. Dr. Boteler once remarked about strawberries, "Doubtless God could have made a better berry, but doubtless God never did;" and the happy thought inspired one of the tavern's delighted guests to exclaim: "Doubtless God might have created a more restful, beautiful, enchanting spot than this, but doubtless God never did; and doubtless it has never entered into the heart of man to select a location more picturesquely charming, or has ever planned and erected a summer home more perfectly appointed and adapted to every requirement for the comfort and refreshment of tired city people than has been accomplished at the Tavern of Castle Crag." This glowing tribute is fully justified by the facts.

A delightful and popular trip is to the Geysers and Lake County. The rail portion is to Calistoga, 73 miles from San Francisco, thence by stage to the Geysers, 26 miles, or into Lake County, distance depending on destination. Both are picturesque and famous.

The **Geysers** are among the noted instances of subterranean eruption, and possess great interest for sightseers because of these wonderful features. But as a resort the place ranks high. Its hotel accommodations are excellent, climate exceptionally agreeable, and recreation abundant.

Lake County's chief attraction is a clear, beautiful, and completely mountain-locked lake, whose picturesque environment shelters such famous mineral springs health resorts as Harbin, Anderson, Howard, Adams, Siegler, Highland and Bartlett Springs, Glenbrook, Soda Bay, Lakeport and others. For aquatic sports, gun, rod and all the other outdoor pastimes, the equal of Lake County will be hard to find. The stage ride to Lakeport is 48 miles, and the other places named are mostly intermediate.

Lake Tahoe is to California what Geneva and Lucerne are to Switzerland. Unlike the latter, however, it is not the central feature of vast industrial activities, and, far different from those of Italy, its shores are not ornamented by princely parks and historic palaces; but, better than either, it is in the Garden of the Gods, and the sublime majesty of Nature is supremely present.



The Lake Tahoe trip affords a long list of delightful attractions. It is made either from San Francisco by rail to Truckee, about 200 miles, thence 15 miles by stage, or as a side trip en route over the Ogden Route, to or from San Francisco.

Southern California is too vast and too thickly studded with rare attractions to be fittingly comprehended in a limited space. Its broad expanse of orange groves and wealth of semi-tropical verdure, its high condition of cultivation, its park-like cities and towns, its enchanting drives, its seaside resorts, and the balmy, perfume-laden atmosphere that pervades it all, have given this nook of paradise enviable prominence. No visitor to California can afford to leave without seeing Los Angeles, Pasadena, Mount Lowe, Redlands, Smiley Heights, Riverside, Magnolia Avenue, Santa Monica, Long Beach, Santa Catalina, San Diego, Santa Barbara,—all of them if possible, some of them without fail.

Los Angeles is about twenty hours' ride from San Francisco, and its surrounding attractions are reached with remarkable ease and convenience, owing both to nearness and the completeness of transportation service. Visitors should make it a point to obtain time folders and other printed information from the local offices of the Southern Pacific Company, which spread out the whole country like an open book.

The Missouri Pacific Railway is the popular line because its trains are the finest. Through vestibule sleeping cars daily. The finest chair cars run daily without extra charge. Through tourist sleepers between the far East and the Pacific Coast are run weekly. These excursions are in charge of an experienced manager. Every attention and courtesy possible is shown passengers traveling over this line.

Ask any Ticket Agent for Time Tables, Maps, etc.

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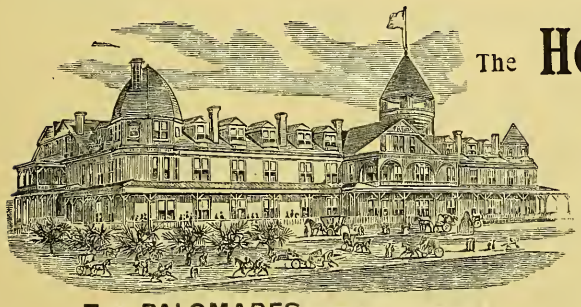

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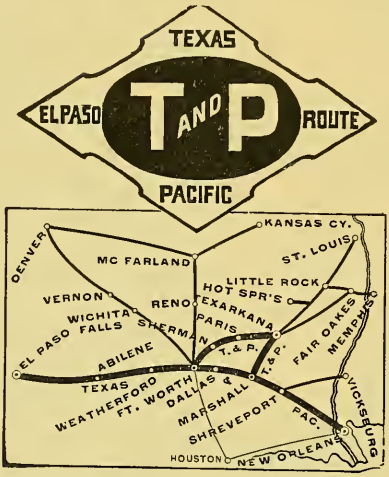

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