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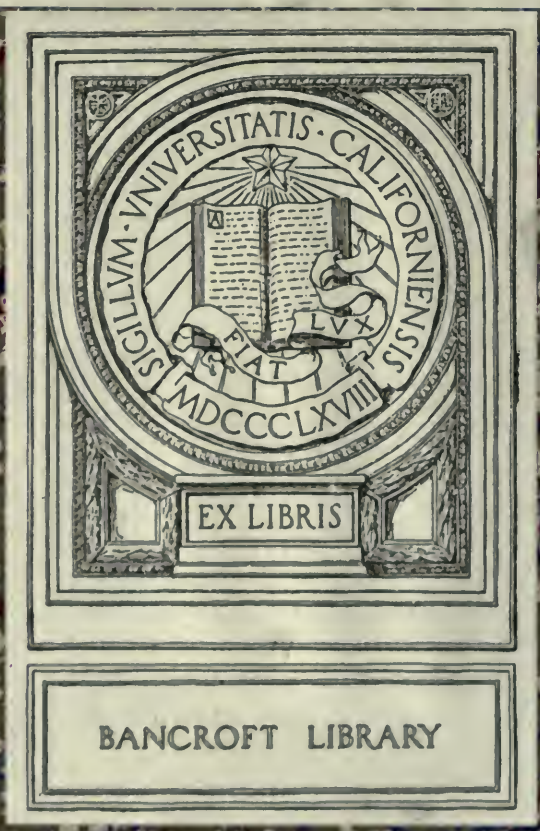

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RESULTS NUMBER

FOR CALIFORNIA

SOME RESULTS OF LUTHER BURBANK'S LIFE WORK
RESULTS FOR SETTLERS--1904
SECOND MEETING OF COUNTIES COMMITTEE
"ONE FOR ALL AND ALL FOR ONE"
WHAT SETTLERS SAY
WHAT ONE SETTLER DID
THE BROWN FAMILY IN CALIFORNIA — JASON BROWN
IMPORTS OF POULTRY, BUTTER, EGGS, ETC., TO CALIFORNIA
ILLUSTRATIONS — ANNA HEIN

THE CALIFORNIA PROMOTION COMMITTEE
SAN FRANCISCO

FOR CALIFORNIA.

JANUARY, 1905.

Application Made at San Francisco Postoffice
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THE CALIFORNIA PROMOTION COMMITTEE

(THE STATE CENTRAL ORGANIZATION)

THE PURPOSE OF THE COMMITTEE IS TO GIVE TO THE WORLD RELIABLE AND UNBIASED INFORMATION REGARDING THE RESOURCES OF AND THE OPPORTUNITIES IN CALIFORNIA. FOR CALIFORNIA IS PUBLISHED TO ASSIST IN CARRYING OUT THE OBJECTS IN VIEW.

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A MONTHLY PUBLICATION

"FOR THOSE WHO DESIRE THE BEST THERE IS IN LIFE."

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BURBANK'S SPINELESS CACTUS

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Some Results of Mr. Luther Burbank's Life Work

THE SPINELESS CACTUS
A RESULT OF MR. LUTHER BURBANK'S WORK

LUTHER BURBANK, most famous plant-breeder of all time, I liken unto Robert Louis Stevenson. There is in him that same gentleness, that tremendous capacity for hard work long sustained, that same daringness to launch out into new fields, casting aside the useless traditions of the past and retaining those which are of value, and there is that same sympathy with all things which marked the gentle Stevenson. And because Mr. Burbank understands the ways of plants as Stevenson knew the ways of men, he has in him that quality which passes into genius. Therefore, no one can describe works of Mr. Burbank so that another may duplicate them, though it is probable that Mr. Burbank's researches will be of as inestimable value to science as the plants he has originated are of commercial value to humanity.

Mr. Burbank has originated or developed more than 2000 new species, sub-species and varieties of plants, including vegetables, fruits, grains, grasses and flowers. Perhaps the latest origination of Mr. Burbank which has attracted most comment of the press is the spineless cactus. This is the cactus generally known as the prickly pear, or, scientifically, opuntia. Mr. Burbank's spineless cactus, however, is more than a cactus without spines. It is a luscious, nourishing forage plant, said to be about half as nourishing as alfalfa and equal in nutritious properties to most of the clovers. Acre for acre, the yield of spineless is much greater than alfalfa. The size and character of the wild plant has been radically improved by Mr. Burbank and the acrid juice found in the wild cactus is eliminated in the spineless variety. The strain has been established and a spineless cactus plant one year old on Mr. Burbank's farm at Santa Rosa is as high as a man's shoulders. One of its leaves would feed a sheep all day.

Only those who have seen cattle die amid the cactus jungles of the great Southwest can realize what an inestimable boon spineless will be to humanity. It will be several years yet before Mr. Burbank is ready to place the spineless cactus upon the market as a commercial proposition. He hopes, among other things, to originate a variety which shall grow in every part of the United States. Mr. Burbank's work is too well

known to require description here. His many marvelous originations have proved of enormous value to humanity. Among those which have perhaps been of the greatest usefulness is the Burbank potato, which, it is estimated, has been worth twenty million dollars to the people of the United States. Mr. Burbank has lately originated a variety of rhubarb, much superior in quality to any known rhubarb, which grows the year round. His wonderful Shasta daisy flares out with snowy brilliancy. The plumcot, a cross between the apricot and plum, and the white blackberry are well known. Mr. Burbank has often been called a wizard, but he is not a wizard; he is a scientist. His results are not the results of an instant, but of a lifetime. He took the shell of the walnut and thinned it until the birds could peck through it; conversely, he thickened it again until it became of its greatest commercial value. He is the Edison of plant life; the bold and daring originator who seizes upon an idea and by the subtle alchemy of hard work, natural aptitude and long experience, impresses his idea upon nature so that it remains thereafter stamped for all time. Mr. Burbank has lived in California for almost a generation. He chose to live here because he found conditions best suited to his experiments, with thousands of plants of the temperate and semi-tropic zones.

Personally, Mr. Burbank is delightful. Last year six thousand visitors called upon him, and to each of them he gave at least five minutes of his time and to some he gave much more. His secretary says that on one occasion some frail plants were perishing because they required attention, yet Mr. Burbank continued to talk with his visitors rather than turn them away, although his loss could not be replaced by several thousand dollars. In person, Mr. Burbank is slight, almost frail, and owing to the tremendous strain upon his constitution, for several years he has not been in the best of health. It is a pleasure to know, through the press, that Mr. Andrew Carnegie has created a fund which will enable Mr. Burbank to devote his whole time to his researches. If Mr. Carnegie had never done anything else but this he would deserve to be remembered for all time. Mr. Burbank is modest and it is through the recognition of his wonderful services as a plant-breeder, and not to his individual efforts for himself (for he has made none) that Mr. Carnegie has created this fund. Mr. Burbank has a gentle face, almost sad, but in conversation it illumines up immensely. I should say his age was about 55 years.

A reproduction of Mr. Burbank's spineless cactus will be found on the frontispiece of this issue.

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WHAT SETTLERS SAY—Continued

CHICO, California, Dec. 23, 1904.

The California Promotion Committee, San Francisco, California:—

Gentlemen: Yours of recent date received requesting that I write briefly my impressions of the State. I will gladly do so, knowing that the work of your Committee is doing a great deal of good, both in our State, and also to those in the East who are contemplating a change of location. For nearly a year before coming here I read very carefully the literature received from you to find out, as best I could, where was the best place to locate, having but moderate means at my disposal. I got valuable information from your Committee, and finally made up my mind to come to Chico. Thirteen months ago we left our home in Illinois and came directly here. There were seven in our party, as a relative and family came with us. Landing in Chico, we at once set about to find a suitable house to establish our families in, but we found that all were taken, so we bought a house which was soon to be completed. We have found everything fully up to our expectations.

I have found a very satisfactory business in my line (bookkeeping) and am so well pleased with the State that in addition to my home in Chico, have bought ten acres of land near the city and intend to buy more as soon as I can dispose of my property in Illinois.

You ask how I compare California with my Eastern home. I have many good things to say of my Eastern home, but for climate and other conditions, California far outstrips all, and I have had a home in Maine, Minnesota, South Dakota and Illinois. I would advise anyone having $1000 or more, who contemplates a change, to come to California. I have no desire to move back to the East.

Thanking you for your courtesies to me, I remain,

Very truly yours, (Signed.) WILLIAM F. KENNEDY.

RESULTS FOR SETTLERS—1904

THE year 1904 has been an important one for California. In a steadfast, sober way, it has seen the greatest year in the history of the State and the many elements in California's progress during the past year work for no class of our citizens more than have those who come to live here upon the small farm.

Perhaps the most significant feature of California's growth is shown by the colonist movement for the fiscal month from September 15th to October 15th, 1904. Almost 30,000 people came on colonist (one way) tickets during this period. As colonist tickets, of course, have no return, almost the entire movement during this period was made up of new settlers. The number of those who took advantage of the colonist rate does not by any means represent the total colonist movement, for many settlers came to the State before the colonist movement had opened and after that date. During the Knights Templar Conclave thousands took advantage of the special rate and the Odd Fellows' celebration was accompanied by a great influx of visitors.

Among the notable elements in the progress of California during 1904 has been the development of irrigation facilities. In May, 1904, there was celebrated at Modesto, in Stanislaus County, a jubilee commemorating the completion of the Modesto-Turlock systems, or rather system, for the district is practically to be watered by an interconnecting set of canals and laterals, which will be capable of supplying water to about 260,000 acres of land. The Central Irrigation Canal, in the middle portion of the Sacramento Valley, has been termed the most important irrigation project to be ushered in in the year 1905. The Central Irrigation Canal started as a district enterprise several years ago. At the present time, work is being prosecuted, and it is expected that the water will soon be running. This canal is 60 feet wide and will, it is said, irrigate 200,000 acres of land, while it may be extended to water millions of acres. Its source of supply is the Sacramento River.

Another great system just nearing completion is the Yolo County Consolidated Canal, which diverts the water of Cache Creek, and will irrigate 100,000 acres of land lying in Yolo and Solano Counties. Water was turned into this Canal on October 8th.

Another irrigation celebration of equal importance to that of the Yolo County Canal was held a week earlier at Gridley, Butte County, and marked the breaking of ground for the Butte County Canal, which will divert the water of Feather River, and covers at present an area of 215,000 acres. This system is capable of vast development, as the Feather River drains an area of 4000 square miles, with an annual rainfall of from 30 to 60 inches. This canal may be made to irrigate all the land lying between the Feather and Sacramento Rivers, from the point of diversion southward, an area of 700 square miles.

Great progress has been made during the last year in the Tulare Irrigation District. The year previous the bonds for this system were paid off and burned. Several thousand acres have been put in alfalfa in this district in the last twelve months.

During the past year, the irrigation system at Imperial, California, on the Colorado River, has increased to 75,000 acres of land under actual irrigation.

This in brief comprises the greatest of the mighty irrigation enterprises which characterize the development of California during the past year.

The tremendous value to California of these irrigation projects can hardly be estimated. Irrigation means more to California than to any other State; not that California needs irrigation more than any other State, for there are many parts of the State with sufficient rainfall for the raising of ordinary crops. The value of irrigation to California lies in the fact that the climate allows irrigated soil to produce the year round.

Two big projects of immense importance to the State are the Western Pacific Railway and the San Pedro, Los Angeles and Salt Lake Railroads. The latter road, usually known as the Salt Lake Road, will soon open short communication between Los Angeles and Salt Lake City, and the Western Pacific Railroad, which now seems sure, will enter Plumas County through Beckwith Pass and come into the Sacramento Valley at Oroville. This road will open up wonderful opportunities for settlers.

Bank clearings show a great advance in business. Building permits in the larger cities and the buildings themselves in the smaller communities and throughout the country, testify to the permanent increase in population.

* * * * *

WHAT SETTLERS SAY—Continued

DINUBA, California, Dec. 26, 1904.

The California Promotion Committee, San Francisco, California:—

Gentlemen: I feel it my duty to let you know how I am progressing since coming to California, for I know you are interested in my welfare on account of being responsible for me locating in California.

I was first impressed with the resources of this State by an article of yours published in the Twentieth Century Farmer, published at Omaha, Nebraska. I entered into correspondence with you, receiving descriptive literature, together with your publication, FOR CALIFORNIA. I can say after residing here since March 20th last that every word you published with regard to the resources, etc., can be verified by any one who has investigated the same.

Having resided at Ruthven, Iowa, for twenty-five years, where the mercury frequently runs as low as 25 to 30 degrees below zero, and being more or less exposed to wet weather, I finally located in northern Tulare County, purchasing 50 acres, where I found sandy loam soil similar to our Iowa sandy loam lands, at prices ranging from $40 to $50 per acre. There are large tracts still unsold which if put in alfalfa, one acre will produce more hay and of a far superior quality than any four acres I ever saw in Iowa. I put in 25 acres. I sowed in September and expect two or more crops next season. The other 25 acres I intend to put in raisin grapes, as this is the home of the raisin.

The winter weather here is like the September weather in Iowa. The summer weather is not as disagreeable as July or August there. The mercury ran 8 degrees higher here last summer than I ever saw it in Iowa, but the heat is so much different that 114 degrees which it registered here on one occasion was not any warmer than 94 degrees would be in Iowa, the 20 degrees being accounted for by the absence of humidity in the atmosphere.

My wife and family join me in thanking the California Promotion Committee, feeling that it would be ingratitude on our parts not to do so, for the valuable information furnished us and for the prosperity we have shared in our California home.

Yours very respectfully, (Signed.) DAVE GAVIN.

Second Meeting of Counties Committee

A MEETING of unusual significance of the organized work for the development of California was that held at Pasadena on December 17th.

Few people realize the unique features of development work in this State. There are in California more than 140 commercial organizations than in any other State, and these expend in development work sums ranging from one thousand dollars a year or less, up to twenty-five thousand a year. In addition to this the necessity of publicity work is legally recognized by the fact that the Supervisors of each county are authorized to devote certain sums for advertising and immigration purposes.

The most vital and fundamental principle as exemplified by the Pasadena meeting was the spirit and good will and co-operation. Representatives from all parts of the State were present. This means that if an Eastern person writes to California for information he will be correctly advised, and if the man to whom he writes does not feel that his locality possesses the conditions desired, he will refer the inquirer to some other organization in the locality possessing those requirements. Many a heart-burning has been caused by the over-advertised El Dorado, but where you find such a spirit as this you will find no heart-burning. Good results have already come from this meeting of the Counties Committee of the California Promotion Committee. Perhaps the most evident feature of that meeting was that all sections of the State are in thorough accord and will work together to advertise the products, resources and opportunities in California on a more effective scale than ever before. Every county in California was represented at this meeting to work for the whole State of California.

The belief was expressed by those present that no single county in the State can raise a fund sufficient to advertise California products to such an extent that the demand for them will make it imperative for Eastern dealers to handle them, but that if all sections of the State unite in this work they can obtain greater results at less expense. The following resolution, which was unanimously adopted, crystallizes the sentiment of the meeting:

"WHEREAS, The tendency of the time is toward combinations of capital in all large undertakings; and

"WHEREAS, The publicity of California is an undertaking of great magnitude and one in which all sections of the State are vitally interested; it is

"RESOLVED, That the Supervisors of the fifty-seven counties of California be respectfully requested to set apart a portion of the amounts appropriated for advertising purposes to be devoted to general advertising by the State Publicity Committee of the California Promotion Committee, as it is the opinion of this meeting that such advertising is bound to be of great benefit to the different counties, in that more effective publicity can thus be given them."

The opinion was expressed at the meeting that common action throughout the State, carrying out the purpose of the resolution, will result in a fund sufficient to enable California to open offices in all the leading cities of the East, where special literature on the different localities in California will be distributed, and where the marketing of California products will be looked after in the East. Through these Eastern offices the commercial organizations of the State will be placed in constant communication with a desirable class of possible future Californians, industries, etc.

The next meeting of the County Promotion Committees will be held in San Jose, May 20, 1905. In the meantime, the members of the California commercial organizations will all work to bring about the desired result, so that California may be systematically and effectively advertised in the East on the broad co-operative plan outlined.

* * * * *

ONE FOR ALL AND ALL FOR ONE

If the California Promotion Committee had rendered no other service to the State than that which it has performed in bringing about a spirit of co-operation among all the chambers of commerce and development organizations of California this useful committee would still have more than justified its existence. At the meeting of development organizations and chambers of commerce held at Pasadena Saturday every county in California was represented. This is the more remarkable when it is considered that some of the delegates had come a distance of six hundred miles to attend the meeting and that many of them represented commercial organizations supported by communities whose aims and interests are, apparently, at variance, if not clashing.

However, the Herald is happy to say that the commercial organizations of California have by their action shown that they are united in their work for the whole State. What benefits one section of the State benefits all California, and what is of advantage to California cannot fail directly or indirectly to further the prosperity of the different parts of California.

The immediate problem presented for solution at the Pasadena meeting concerned a systematic campaign in which all the organizations in the State shall take part, to advertise the products, resources and advantages of the State throughout the world. No single organization can raise a fund sufficient to advertise California fruit or other products on such a scale that the resultant demand shall force those products on the markets of the world and shall make it imperative for dealers of importance to handle them.

The 146 commercial organizations of California are, however, when united, in a position to do this without inconvenience to themselves. The funds of the commercial organizations of the State vary, it is estimated, from about $1000 to $25,000 per annum. In addition to this there are the funds which the boards of supervisors of the several counties are enabled to expend for advertising and immigration purposes. A pro rata contribution from the commercial organizations of California would enable the State to be more effectively advertised than ever before; it would give each of the organizations a greater field for usefulness through the increased demand for products and vast number of settlers who would be attracted to the State through a systematic and vigorous campaign. The effect of such co-operative work would probably increase to an appreciable extent the contributions to the local commercial organizations throughout the State.

The plan as outlined for this centralized publicity campaign is a wise one, every section of the State being represented on the State publicity committee.

The meeting at Pasadena was the second semi-annual meeting of the county promotion committees of the State. These committees unite the commercial organizations of each county on a basis of equal representation. They work with the State publicity committee.

California is one State and it should never be otherwise. Those who have argued for State division perhaps forget that besides the greater expense of running two State governments, California if divided would lose her most remarkable and attractive asset—that of her vast diversity. Our big trees, our redwood forests, our orange groves, our Yosemite, our coast line of 1200 miles, would no longer be unique as existing in one State, the united California.—Los Angeles Herald, December 19, 1904.

WHAT SETTLERS SAY

SOME RESULTS OF PROMOTION WORK.

It is a great human interest story this, of the coming of new settlers, of breaking up the fresh ground for the plow and of the industrial development of many regions undeveloped and unproductive. To no institutions in California is a more sacred trust imposed than upon its development organizations. These organizations, by their very nature, invite confidence and command respect. The newcomer naturally looks for guidance to the commercial organizations of California, and it is a favorable comment upon the character of these bodies that they will never advise a settler to come to their locality knowing that it is not suited to their needs, but will direct him to some region which, in their opinion, meets the requirements of the newcomer.

The California Promotion Committee has directed thousands of settlers to California, and has seen that they are properly cared for on arrival. The Committee has received many letters from settlers that they are pleased with this great new land. The following few expressions of opinion are taken at random from many letters.

Mr. Charles M. Corey, who came to California from Lutesville, Missouri, after correspondence with the California Promotion Committee, says he is well satisfied with California. Mr. Corey writes from Allendale P. O., Fruitvale, as follows:
The California Promotion Committee:

Sirs:—As you have requested me to write an article, stating what I think of California when compared with my Eastern home, and as I feel under some obligation to you for literature and information kindly sent me before coming here, I will endeavor to comply, although article-writing is out of my line.

But I will say this, that after spending fourteen months here that I am well satisfied with the country, both as to climate and the general resources of the country. I am not sorry for what I have done in disposing of my property in the East, for the purpose of coming to this State, which is contrary to the prophesies of my friends in Missouri.

The one thing which pleases me above all others is the improvement of my health. There is something in the air which I will not undertake to explain, but which is invigorating and seems to buoy a person up; and there are more bright days, which are neither too cold nor too warm, but just right to work with your coat off, than in any other State in the Union. Instead of cold weather, snow, sleet and ice, we have mostly pleasant weather, with an occasional rain or fog, and sometimes it is most too cool to sit around comfortably without a little fire. It is always cool of nights, and also when it rains; now and then we have a slight frost in winter, but not enough to do much harm to growing plants.

I can only speak of this central part of the State, along the coast and in the neighborhood of San Francisco, as I have been satisfied to stop right here where there is plenty of fruit and flowers; and in these this State beats the world.

Yet I am told that this is only a fair sample of what I might find in most any part of the State. I have bought oranges here at 7½ cents per dozen. This State affords splendid opportunities for skilled labor; for instance, plasterers and brick-layers receive $6.00 per day of eight hours; first-class carpenters, $4.00; girls who are good cooks and thoroughly understand housekeeping receive from $25 to $35 per month, and so forth.

Now, it would not be fair to close this article without enumerating some of the disadvantages which exist here. The price of fuel in Fruitvale is higher than in my former home, wood being about $5.00 per cord, coal 60 cents per sack, and as high accordingly by the ton. Yet those in the East must bear in mind that not much fuel is needed except for cooking purposes. A great many use nothing but oil or gas the year round.

Yours truly,

(Signed.) CHARLES M. COREY.

Allendale P. O., Fruitvale, Dec. 20, 1904.

WHAT ONE SETTLER DID.—COLVIN B. BROWN.

While it is the purpose of the California Promotion Committee to give only that data which relates to average conditions, so that the intending settler may not be led astray, but may find things as represented with a fair prospect of being able to do as well as the average person who has succeeded in agriculture in California, still there are, at times, incidents of phenomenal success, while not in any way indicative of average conditions, are well worthy of publication.

H. W. Cowell, of Manteca, a small flag station in the southern part of San Joaquin County, has, within the past few years, made one of these phenomenal successes in dairying.

Seven years ago, Mr. Cowell owned 300 acres of land in this district. The soil was sandy and the land, without water, was only partially productive. Mr. Cowell was a great believer in irrigation. He promoted a scheme to bring water to his land, a distance of more than fifty miles. The accomplishment of his purpose was only done at the expense of heavily incumbering his property. The water was brought to the land at the height of the panic of '97. The pressure was too great for Mr. Cowell, and he was obliged to succumb financially. The banks took all of his property, leaving him practically penniless.

A year or two after this, Mr. Cowell, having lost no faith whatever in the possibilities of the Manteca district under water, sought out the bank which had foreclosed upon him and asked the privilege of going back upon his land, with the privilege of purchasing at the price at which the bank had bought the land in. The privilege was granted.

Mr. Cowell went back upon his land with no cash, no harvested feed, no farm tools. The entire stock upon the ranch consisted of three head of small, cheap mule. Growing upon the ranch, and now under water, were ninety acres of alfalfa. Mr. Cowell bought a number of standard bred cows on time. That year, in the foothills, there was a scarcity of feed, and the alfalfa pasture on his farm brought good prices. In six months he had paid for the cows purchased on time and had gone in debt for an additional number. The following Spring he paid for the cows purchased and started a skimming station. The next year, besides the receipts from his skimming station, he began to sell beef and pork.

In seven years he had paid for the ranch and had $17,000 in the bank.

He claims that any one applying the same amount of time and thought to the work that he did could make a similar success in dairying on the irrigated sand lands of San Joaquin County.

* * * * *

LOS ANGELES, California, Dec. 23, 1904.

The California Promotion Committee, San Francisco, California:—

Gentlemen: I hereby wish to thank you for all the useful and helpful information that you sent me prior to February 11, 1904, while I was a resident of the City of New York. About October 15, 1903, I had heard a great deal about California and I decided to write to you and get all the information that I could about this country, climate and the prospects of securing work after I should arrive out here, provided I came out, and after I had received several letters from you giving me the information I had asked for, I made up my mind to come to California and locate, which I did by leaving New York City February 4th and arriving in this city February 11th. I found the climate and weather and country perfectly lovely, and such elegant flowers of all kinds in bloom all winter long outdoors, it was a very pleasant surprise to me. I love this country very much indeed and I would never go back East again to live, as this country is good enough for me. I have succeeded in getting plenty of work and I find the wages are just as high as they are East, and I can live cheaper here than I could in the East.

I can cheerfully recommend this country to anyone who is thinking of coming out here to make their future home. My mother arrived here about October 4, 1904, from Ocean Grove, N. J., and she likes it so well that she says that she would not go back East again to live if some one should buy a ticket and present it to her.

Fruits and vegetables are cheap out here.

Thanking you for your kindness to me, I remain,

Yours respectfully, (Signed.) A. E. OSTROM.

(Continued on pages 4 and 6)

THE BROWN FAMILY IN CALIFORNIA

By JASON BROWN

CHAPTER ELEVEN

IN WHICH WE ADD A YEAR'S RESULTS

DARK indeed is the Valley of Death to those who fear their dear ones treading toward it, and yet have in their power no ability to rescue. How bright is life when we are able, by God's mercy, to lighten those gloomy shadows and turn illness into health!

So thought I, as on the New Year's eve, I watched the long purplish shadows which the dying sun cast forth from the distant foothills until they trembled, palpitated, wavered and, at last deepened into twilight. Then came darkness burying like Death itself all things from man.

"Law, Jason," cried my wife, bustling cheerily upon the veranda, "you sitting out here alone! I wondered where you were. What do you think; my young chicks are coming out of the brooder fine and dandy. I'll have the first spring frys on the market."

"Chickens never had a better mother," I said, looking into her glowing face, radiant with health. "Do you know, wife, as I've been sitting out here, I've been taking stock of our first year in California—adding up our credits and our debits. The greatest item on our credit sheet is your return to strength."

"Yes, isn't mamma looking well," assented Ethel. "Mrs. Simpson says she is younger than I am."

"And so I am, you minx," cried my wife, happily. "It's all because good old Doctor Cunningham read that advertisement of the California Promotion Committee and sent us Browns out here to California."

"Gracious, here comes William Simpson and his wife."

"Here's a New Englander," cried the jovial Simpson, "who not only has not put all his eggs in one basket, but has put the different eggs into the right baskets.

"Let's take an inventory, Jason, and see what your first year in California has brought you."

"Well," I said, "I bought twenty acres of good agricultural land, at one hundred dollars an acre. That alone cost me two thousand dollars. I could have secured good agricultural land, but not quite so near the railroad, for from thirty-five to fifty dollars an acre."

"Good," said Simpson, "and the best thing you did was to put all your land under cultivation."

"Yes, we started right in. Our five-room cottage of redwood cost eleven hundred dollars. We got four good milch cows for fifty-five dollars apiece, and with our hogs, poultry, horses, farm machinery, fixtures and improvements, the total cost outside of the land, ran up to seventeen hundred and seventy dollars. Altogether, I had only three hundred dollars left out of the four thousand from the sale of our New England farm."

"Right again," said Simpson, "and like a sensible man, after you had got things started, you took your team and worked for somebody else. There's practically a demand in California all the time for the fellow who can handle a farm team."

"Yes," I said, "that helped out considerable, and while I was working out with the team, Mrs. Brown borrowed your incubator, and she and Ethel hatched out two hundred and forty-one chicks out of three hundred eggs and got 'em on the market for early spring frys. At the same time, Paulsen came for a dollar a day and board, because his partner had the team on his farm and so he couldn't use it, and he and Robert and Walter got the truck garden started. Then just a little later we made an arrangement with the butcher, and when he peddled his meat around the country twice a week he took our eggs, poultry, butter, milk and garden truck, and sold them on commission."

"And I, who am manager of a ranch big as some counties in the East, bought a lot of your produce just because I, like a lot of other fellows on the big ranches, thought I hadn't time to raise it," put in Simpson.

"And so we began to get an income," said my wife. "A few quarters here, a few dollars there, but at the end of the week it amounted to something and tided us over from month to month."

"You were bound to win out," said Simpson, "and of course you did, for you were working along the right lines. The diversified farm, backed by alfalfa and irrigation, is an economic proposition in California. Why, in the last fiscal year California imported 7171.5 tons of butter and eggs and 4227 tons of poultry. Just think of that, pretty near eight and a half million pounds of poultry alone, and this State can't be beat for raising poultry."

"And then there was the barn. All the neighbors came and helped me put it up," I continued, supremely ignoring the digression of the statistically inclined Simpson. "And when the barn was built, some one thought we ought all to get together and have a co-operative creamery."

"Oh, you modest Jason," chuckled Simpson, digging me in the ribs. " He doesn't want the credit for the creamery idea, Mrs. Brown, but, all the same, we put the creamery on your place."

"Yes, and you wouldn't take any money, but took the ground as my part."

"That's all right," said Simpson. "The little creamery only cost thirteen hundred dollars. It only took a hundred dollars from each of eight of us to start it. Why, it almost paid for itself in the first six months. Now we are running on velvet."

"Yes, we will have to enlarge. The separator only has a capacity of four hundred and fifty pounds an hour. That engine has power enough to run a larger separator. If I remember rightly, the separator, engine, churn, butter worker, Pasteurizer, cream vats and incidentals came to seven hundred and forty-five dollars."

"You bet, that's a dandy engine," cried my boy, Robert, who had been honored with the post of official engineer and gloried in his engineer's cap and blue jeans.

"Me and Walter, when the creamery ain't running, saw up a lot of eucalyptus into stove lengths for fire-wood.

"Jason, you have omitted something," said my wife.

"Ah, yes, our little prize heifer. She isn't so little, though, for she's a Holstein. She's a wonderful milk giver, and if everything goes well she's the nucleus of a herd of fine-bred stock."

"And the aggregate results of the year?" suggested Simpson.

"Well, we haven't made a fortune; but we have been comfortable and never once in debt," I said. "I figure that the total proceeds of the farm, with our work on it and my work outside, have brought in about eighteen hundred dollars. This is not net, though. We must deduct from it wages of help, and such living expenses as had to be made in buying things we don't raise. Next year we're going to raise pretty nearly all our own food. Still we have several hundred dollars in the bank, and I figure that the farm is worth a great deal more than when I bought it."

"Well, you've done well, indeed, Jason," said Simpson, as he and Mrs. Simpson rose

to go. "You've raised a tremendous lot of garden truck, vegetables and poultry, besides your hogs, five milch cows, two horses. You have had every acre producing—you have raised fodder for your stock and turned alfalfa and skim milk into pork. You haven't taken chances on crops you didn't know anything about, and next year you will find a bigger balance in the bank."

So we wished our kind neighbors a prosperous New Year and turned in for a good night's sleep, our hearts full of hope and confidence in the future.

In the February number of For California will appear some interesting and profitable facts about irrigation and what the Brown Family learned about it.

* * * * *

Eight and a Half Million Pounds of Poultry and Fifteen Million Pounds of Butter and Eggs Brought Here in One Year.

Millions of dollars' worth of products that can be and are raised here successfully are brought to California from the East each year.

The California Promotion Committee announces the following imports from the East for the fiscal year ending June 30th, 1904. These figures are compiled from statistics furnished by the various transportation companies:

Imports.	Tons.
Butter and Eggs	7,171.5
Poultry	4,227.0
Cheese	2,002.0
Hams and Bacon	603.0
Beef and Pork	2,044.0
Lard	3,566.0
Meat in bulk	11,012.0
Tallow and Grease	132.0
Packing House Products	7,253.0
Cottolene	630.0
Tankage	360.0
Live Stock	20,550.0
Total (in tons) of imports	59,550.5

The exports of the same products for the same period were only 714 tons, of which there were 41 tons of butter, 20 tons of packing house products, 13 tons of lard, the remainder being live stock. The figures given are conservative. In all cases where shipments have been made in car-load lots, the minimum carrying capacity for the different invoices have been taken. If the average had been taken these figures would show up bigger than they do; but for the sake of over stating the lowest possible estimate is given in every case. The amount of poultry imported into the State during the fiscal year ending June 30, 1904, is close to eight million pounds, and it is believed by the Committee that for the year 1904 almost ten million pounds of poultry will have been brought from Eastern States.

California pays millions of dollars to the East for these products. Were the imports enumerated in the table given to be estimated as low as 10 cents per pound, they would have a valuation of $11,910,100; but butter, eggs and poultry, as well as most of the other products enumerated, are not to be shipped here to take the place of California products at these figures, as anyone who raises poultry knows. The Committee believes that the amount of money sent out of the State each year for products which could be raised on the small farm reaches far up into the millions. Besides the articles given in the Committee's tables, thousands of tons of vegetables of every kind are brought into California every year. All these articles can be raised here, not only to supply Californians, but to supply the markets of the world. The supply of poultry products in most localities throughout the State is not nearly equal to the demand, and this is brought out practically by the products herein enumerated.

California has grown more rapidly during the last two or three years than in a decade previous, and thousands of acres have been made available for the small settler so that he can go into Diversified Farming. It is estimated during the past year no less than 460,000 acres of land have been thrown open to irrigation. Larger quantities of poultry are raised in California every year; dairying is increasing at the rate of over a million dollars a year, and yet the poultry and dairy products are shipped into the State in great quantities.

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MAP SHOWING TOTAL YEARLY RAINFALL (PRECIPITATION) IN CALIFORNIA, BASED ON TWENTY YEARS' RECORD

(FOR AMOUNT OF RAINFALL IN INCHES OBSERVE SCALE OF SHADES)

IRRIGATION AND CLIMATE

PROF. A. C. McADIE, U. S. Weather Bureau

AMONG the cardinal principles laid down in standard works upon agriculture is this, that though all plant life is largely water, and plant nourishment is obtained from air and soil, the chief function of ordinary earthy soil is to afford standing room for the plant. In California there is no dearth of soil. In other words, there is a large amount of excellent standing room and the chief object of Irrigation from the good citizen's standpoint is to decrease this standing room by filling up vacant places with living plants and after these, homes and habitations. California has soil, water and climate. Climate must be taken as it is. But water can be stored and used when needed and even the soil modified and to some degree controlled.

If the rainfall of California could be distributed equally over the State, there would be enough to satisfy all. But the rainfall is not equally distributed and some portions of the State have too little and other portions too much. It is in that portion of the State where the rainfall is scant that the greatest gain in population and home building has been made, and the explanation is given by the words Climate, Soil, Irrigation.

The rainfall map herewith shows that there is a large water supply in California. It is necessary in the southern portion of the State to get a maximum efficiency from the water; whereas in some portions of the north and at certain times, especially from January to March, under existing conditions, an excess of water works positive injury. In the same section much fertile land could be cultivated if properly irrigated. But all years are not alike, and even in the north with a plethora of water, there have been seasons when the rainfall did not exceed five inches, where the average seasonal, for a period exceeding fifty years, is about twenty inches. And conversely, in the far south there have been seasons of fifteen inches (in one year twenty-six inches) where the normal seasonal rainfall based on fifty-five years' record, gives about ten inches. In a single month, January, 1884, nine inches of rain fell at San Diego and at Los Angeles thirteen inches. Such seasons are generally associated with enormous crop yields.

California, then, both north and south, is a land where water plays an important role. It is

a land well adapted for the highest development of irrigation. The climate, the soil and the water are present, but only by a wise use of the last of the trio can man fully appreciate the blesing of the other two.

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HOW TO IRRIGATE ALFALFA.

ARTHUR E. MIOT, Secretary Tulare County Board of Trade, Visalia, California.

While the amount of water applied and the time of its application must be largely governed by the nature of the soil and the weather conditions, the system of flooding is the universal method used. Under this method of irrigation a uniform distribution of water over the surface of the land is the prime object to be attained. Hence the preparation of the land is the first and most important factor in the proper irrigation of alfalfa. The better the land is leveled and checked and supplied with distributing ditches, the better the result in spreading the water a uniform depth over the land will be. He who plants alfalfa should remember that the work being done is not temporary, but must stand for years, and that once properly done is always done. Also, that the time and labor expended in the proper preparation of land is an investment. The saving of water alone in the amount required for irrigation on land properly prepared will soon repay the expense incurred in thoroughly doing the work, to say nothing of the increased yield as the result of proper irrigation. As to whether square or contour checks are to be used, will depend upon the topography of the land to be irrigated, and the amount of land to be inclosed in each tier of checks should be governed by the volume of water available for irrigation purposes. The greater the volume of water, the farther apart the checks may be placed; and contrariwise for a small water supply. The checks themselves or ridges should in all cases be built with scrapers, and should have sufficient width of base to enable them to be broad and rounding at the top so the mower and rake can pass over them with ease, and that the alfalfa may find sufficient surface on the top of the ridges to form a sod uniform in thickness with the level land. When the water supply is cheap and abundant, the water may be spread over the land by drawing it from check to check; but where the supply of water is limited, a great saving will be accomplished if the land is plentifully supplied with small ditches from which the water can be delivered into the checks, thus preventing the continuous flow of water from one tier of checks to another, which is wasteful from the fact that the first tier of checks into which the water is delivered will receive a greater amount of water than is actually required, while the last checks will possibly not receive a sufficient quantity. In pump irrigation (by this we mean where the water for irrigation is supplied with pumps) small checks and numerous supply ditches are an absolute necessity for economical irrigation; and under this system it is better to carry the water to the point farthest from the pump to commence irrigation. Then if for any reason the pump has to be shut down and the water supply stopped, it is not necessary to traverse the same land a second time in the delivery of the water. As to how much water should be applied at each irrigation, is a question that can be decided only by the nature of the soil upon which it is to be applied. Where the water level is close to the surface of the earth, frequent irrigations are not necessary. Through a greater portion of the San Joaquin Valley, and especially the upper part—which is formed by the deltas of the Kings, Kaweah, St. John and Kern rivers—one and two irrigations a season are sufficient. On sandy or gravelly lands, where the surface water is not close enough to the surface to furnish sub-irrigation, the amount of water applied must be greater and the number of irrigations more frequent. In all cases we believe that the best results are obtained by thoroughly saturating the ground in the early spring and lessening the amount of water applied as the weather becomes warmer. Where the water supply is available at all times, an irrigation of from three to six inches after each cutting will be the best method of irrigation upon lands that have no sub-irrigation supply. On heavy alluvial soils that are sub-irrigating in their nature, one irrigation in the spring and one the latter part of June will be all that is required.

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The World To-Day, of Chicago, in its March issue, out February 20, will contain a highly illustrated article entitled "Building Up a State by Publicity." This relates to the work of the California Promotion Committee and organizations throughout the State which are working for California.

The Use Of Irrigation For Different Crops

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

IF ONE could prepare plain schedules of the amounts of water to use for different crops with the dates at which the water should be applied, and could make such a schedule in all respects conducive to the highest success with all of the plants specified, the service would be worth more to the country than the thirty odd millions of dollars which are now lying in the treasury at Washington awaiting expenditure in irrigation development. But no one can ever perform such a valuable service; in fact, no one can ever make out such a schedule for a single one of the numerous crops which are grown by irrigation which would be more trustworthy than was the old "farmers' almanac," as a weather prophet. It is a wise man who knows just when to use water and just how much to use for the best growth of the crops on his own farm. It is beyond human wisdom to prescribe times and amounts for all crops in all places. This proposition should be generally understood, for it is fundamental in irrigation practice and the following truths are involved in it:

(a) Different plants require different amounts of water and the same plant may require different amounts of water at different times in the growing season.

(b) Different soils require different amounts of water to produce satisfactory growth of plants.

(c) Different local climates, chiefly because of the different degrees of thirst in the air, require different amounts of water and different intervals between applications, for the same crop.

It appears, then that the irrigator must know the needs of his plants, the water-capacity of his soil and the rate of use by the plant as well as the rate of waste at different times of the year. It would be exceedingly hard to express any of these mathematically and with such variable conditions the most accurate expression of that kind would have very narrow application. Fortunately, however, the plant itself is an unerring revelator and gives signs of thrift, content, productive ability, or the reverse of these, as the case may be, and these are the signs which the irrigator must learn to recognize, for they convey the deepest meaning to the intelligent observer. Do not look, then, for easy recipes for irrigation. Receive suggestions from the methods

of others as they appear in print, or are demonstrated in garden, field and orchard, but do not look upon the practice of other men on other lands as a thing to be imitated by you without thought to see whether the plants show you that they are fully suited and thus prove to you that your conditions are like those of the other men. When his is done there is often much to be gained by imitation.

To know a plant's condition by its looks is not always easy or simple, but the beginner must learn to do it. Of course, for this brief outline we must rule out all unthrift of plants caused by insects or plant diseases, or by alkali or other defects of the soil. Attention must be confined wholly to the influences of adequate moisture and of the lack of it.

Indications of adequate moisture are:

(a) Full and free growth of each plant according to its nature and one must learn by experience what that growth should be.

(b) Good size, substance and color of leaf; freedom from curling or drooping or other indication of distress; in the case of vegetables, freshness and crispness.

(c) Satisfactory size, quality and commercial acceptability of fruit, grain, or vegetable. This is the ultimate test of adequate moisture and is assurance that moisture remains until the close of the season which is a most important consideration.

The opposite of the foregoing indicate the need of more water; and, if irrigation is practiced, either the use of more water or the application at shorter intervals is necessary.

These are also indications of excess of water either from natural retention in an undrained soil, or from excessive amount or frequency of irrigation.

(a) Too lush and rank growth causing weak stems and lack of erectness in the plant, or watery, flavorless condition in esculent parts.

(b) Failure to set fruit because of excessive vegetative activity, as in the case of the tomato.

(c) Disease of the root resulting in decay thereof, manifested by the dying back of the spring growth and by gumming and dying back of branches later in the season. Dieback is also caused by drought, but is then preceded by other signs of suffering.

These things being true, it follows that any rule for the irrigation of any plant will fail in many cases because it cannot include consideration of all soils; and any rule for the irrigation of any soil will fail in many cases because it cannot include consideration of all plants. The only rule which will be universal is that the amount or frequency of irrigation must vary in accordance with the character of the soil, the requirements of the plants and the dryness of the air at the time—which is merely a formula of variables and no rule at all.

And yet one should not be discouraged by such a confession. It is proof that irrigation is a rational proceeding and cannot be mastered without close local observation and earnest thought. Growing plants by irrigation is a higher art than growing them by rainfall; it produces richer results and reaches them with greater certainty. Nature is intensely cruel to plants. Nature, for example, destroyed the finest forests which she ever grew, and yet Nature operating according to her own plans and selecting plants for different situations, produces better results than when man choses the plants and situations to meet his own desires and calls upon Nature to nourish them without effort on his own part to assist in bringing plant food and water to meet the needs of the plant. People sometimes exalt the beneficence of Nature in agriculture, forgetful of the fact that even before the dawn of history man had learned that agriculture is in its very nature artificial and not natural and that the grandest work of Nature is the mind of man with power to direct natural forces and assemble them for his own purposes. This same mind of man which learned the advantage of irrigation in the Garden of Eden, must still give its best powers to determining what are the best uses of water for every plant desired; upon every acre chosen for its growth; in every climate which presents desirable temperatures. This is the most important lesson the intending irrigator has to learn and the sooner he makes it the foundation for his future courses the wiser he is and the more prosperous he will be.

Berkeley, California, January, 1905.

LIBRARY OF THE UNIVERSITY OF

Irrigation Regardless Of Rainfall

WILLIAM E. SMYTHE, Author of "The Conquest of Arid America," etc.

MANY years ago, when Irrigation "cranks" were by no means as numerous as they are to-day, I received a telegram from the Superintendent of the State Insane Asylum at Kankakee, Illinois, which read as follows:

"Send me an expert irrigator at once. Signed, Dr. Clarke Gapen."

I was editor of an Irrigation journal at the time and was credited with far more knowledge than I actually possessed—a fact which I tried to conceal, with what success I do not know. My first thought on receiving the telegram was that the good doctor had joined his unfortunate patients and gone mad. However, I found an irrigator for him and dispatched him to Kankakee. That was the last heard of the matter until the receipt of an enthusiastic letter from Dr. Gapen some time afterwards.

The doctor explained that he had formerly expended about $15,000 every year for vegetables to supply the great institution under his charge and that it had suddenly occurred to him that if he could control the moisture during the dry period of the Illinois summer he could produce these vegetables on the farm belonging to the asylum. He bought an inexpensive pumping plant and went to work under the advice of his expert irrigator. As a result, he saved the annual expenditure for vegetables and a good deal more than paid for the cost of the plant the first year. Now, Illinois is not generally regarded as belonging to the arid region. On the contrary, it enjoys a very fair average rainfall. But after his practical experiment, Dr. Gapen made this highly interesting statement:

"I am convinced that if land in Illinois is worth $100 an acre without irrigation, it is worth $500 an acre with it."

A little fact sometimes goes much farther than a large amount of argument. Hence, I am always glad to give the facts about the Kankakee experiment when asked if irrigation pays in localities of considerable rainfall. Here is another fact along the same line:

There was once a market gardener in the neighborhood of a large New England city who always had the earliest, the latest and the best vegetables in the market. His customers could not understand the secret of his success and his competitors were in despair until someone dis-

covered that he had been systematically stealing water from the city main and engaging in the surreptitious irrigation of his garden. So irrigation performed its miracle in the moist climate of New England quite as effectively as it does in the arid West. Indeed, the famous market gardens at Arlington, in the Boston suburbs, have been irrigated for years. Elaborate experiments conducted by the Government in New Jersey have completely demonstrated that irrigation is a paying investment there. Major John W. Powell said years ago: "There is probably not one acre of tillable land in the United States the value of which would not at least be doubled by skillful irrigation." I have no doubt the statement is correct.

There are many parts of California where irrigation is not employed, but there is no part of California where its employment would not increase land values, raise the standard of living and produce remarkable social gains. But this statement should always be accompanied with the proviso that the work must be done skillfully and that good drainage, either natural or artificial, must supplement irrigation. Of course, there are moist lands where certain crops may be produced with the utmost success without the aid of water from a ditch, but this is merely natural sub-irrigation—a matter wholly apart from the annual rainfall.

Even in those portions of California which receive the largest amount of rain and snow, there is a long dry period during the season adapted to the growth of crops. There cannot be continuous production, and, therefore, the largest production upon a given area, without artificial moisture. Neither can there be the largest diversification of crops. It consequently follows that there cannot be the densest population, the smallest farm unit, and the highest social conditions. In other words, we simply cannot make the most of the wonderful soil and climate with which God endowed the State of California unless we have the widest application of scientific irrigation. Until this fact secures general recognition, and until we control and utilize the last available inch of water, California cannot begin to approach its highest development, or take its true place in the ranks of civilization.

This doctrine is unpopular with certain men and in certain localities. Lands are sometimes advertised with the statement that "No irrigation is required." Inquirers are even informed that irrigation is an injury, especially to fruit. The latter theory once prevailed in the Santa Clara Valley, but public sentiment has changed. Unskillful irrigation may do harm in the dryest places, but skillful irrigation will do good even where rainfall is most abundant. The man who insists that irrigation is not necessary generally has unirrigated real estate for sale. It is when he is particularly hungry for a customer that he goes farther and assures you that it is a very great misfortune to be able to control the moisture and apply it to your trees, your garden or your field at the particular moment when it is needed to produce the best results. But if you cross the road and make your inquiries of the man who is making his living by tilling the soil in the hot and dusty summer, you are pretty certain to hear a different story.

California has been in the past the land of great estates, but it is destined to be the land of little farms. It has been the place of speculation, but it will be the home of sober industry. It has expended its efforts largely in the production of single crops, but it will be the paradise of diversified farming. Its one thought used to be to get rich, but now its dream is to get a living—a noble, generous and well-rounded living for the masses of men. Over and above every other land the sun shines upon, California was designed to be the land of the common people.

The greatest single influence in bringing all this about will be the extension of irrigation wherever water can be found to put upon the land. And this will be done regardless of rainfall. The process is well under way and gathers force with every passing year. It pays as a matter of dollars and cents, but it pays even better in the form of social dividends. Men did not know this at first. They have learned it in the school of experience. We are only beginning to understand the laws of the universe and to comprehend that, since laws cannot conveniently be repealed, we had better shape our customs to suit them. Hence, we shall irrigate from Siskiyou to San Diego—from Truckee to the sea.

Considerations For The Novice In Irrigation

WILLARD P. CALKINS, Publisher Orchard and Farm.

THE Eastern man, farmer or not, who has a notion of linking his life with the soil in California, reads at home, or sees during a trip, more or less of the attractions and the changed conditions he will encounter here, and very likely the idea of Irrigation is what strikes him as most strange. Perhaps he has an initial prejudice in favor of districts of the State where "irrigation is not needed," but if he decides in favor of some of the irrigated colony tracts or districts, he probably feels somehow that he will be able to succeed through getting around the laws of nature. It is so different from the old way with which he and his people have always been familiar. His point of view is different from that of a man raised in an irrigated country, and his point of view is a wrong one. To him it is the proper and natural way of agriculture that crops shall be watered by the rains that Providence sends in their season, and from his point of view irrigation is a reversal of the natural process and a convenient and successful remedy for a bad natural disadvantage. His ideal agricultural region would be attended by abundant rains in proper season.

He should shift his point of view and find the ideal, the "natural," if you please, in an irrigated country. It is water at the roots of growing things, and not in itself rain from above, that gives life to what springs from the soil, and it was no more ordained by nature that man should depend only on the clouds for his crops than that he should depend on the natural condition of the soil without tillage. The ideal conditions under which a man may till the ground are those of rich soil, abundantly watered at the right time, much sunshine to promote growth and little rainfall to produce uncertainties and interfere with work and plans. As William E. Smythe has said, "Irrigation is not a substitute for rain, but rain is a poor substitute for irrigation." With this conception the colonist will not come to succeed in spite of a light rainfall, but to find a chance to be an ideal farmer under ideal conditions.

The absolute certainty of the water needed for crops is something that, in itself, the Eastern farmer can readily appreciate, for from boyhood he has seen lean and fat years, according to rainfall, and frequent partial failures of this and that crop. He can recall many times of intense general anxiety and the prayers that went up-

ward while cornfields withered. When, during the long rainless summer in his new California home, he lets his furrows fill with water exactly according to his judgment or pleasure, he will realize what the elimination of the rain problem means. California has its rain problems, of course, but they disappear to the degree that the irrigation problem is solved in any region. The Eastern man may reflect on what premium he could afford to pay at home through a term of years to be fully insured against all, even partial, failures of crops through lack or excess or untimeliness of rain, and then reflect that he may get that insurance in an irrigated district, along with much else, by paying so much an acre for water. What would he have paid back there to be able to start and stop the rain, have it drizzle or pour, fall during determined hours, and on this field and not on that? Here he may do all that, in effect, at a cost of 50 cents and upward per acre.

One of the many elementary conceptions to be gained by the stranger to irrigation is its relation to land values. Irrigation is a something that in itself makes land worth more—more than the same land would be worth if a miracle provided the rainfall of a humid region. Irrigation develops the highest possible commercial value of land for agricultural uses, and the highest priced lands in the United States are in some of the most completely developed and peopled irrigated districts of California. The Eastern man bought or sold farms without thought of the water. It went with the sky above. In an irrigated district he conceives of buying two things, and the water is a very real and tangible property and marvelously cheap in relation to its intrinsic value.

Some colonists come to California seeking a fully developed income-producing home, as one would in the East, but most people who go westward for land figure on buying what will increase in value as well as provide an income. "Cheap land" is everywhere a great motive in immigration. There is no desirable part of the world where one may pursue that plan with greater confidence in the future than in many of the districts of California now or soon to be provided with irrigation systems. Here, particularly in the great central valley of the State, are hundreds of thousands of acres, recently or soon to be brought under canal systems, which can now be bought for, say, $25 to $75 an acre with water rights.

The colonist from the East is characteristically a progressive man, apt to appreciate the meaning of modern "scientific" agriculture. He will soon see that scientific agriculture reaches its highest possibilities in a sunny and winterless land with the aid of irrigation. "Intensive culture" and "diversified farming" are elementary features of the modern gospel of agricultural success and he may readily see that on the small California irrigated farm these principles may be carried out to incomparable perfection.

The California climate will make a difference in the current of his life and labor and so will his coming within the influence of this institution of irrigation. It characteristically means small farms, near neighbors, enterprise, thrift, prosperity, intelligence, a greater feeling of common interests, more ready co-operation and more of the material conveniences and adornments of modern civilization. Self-sufficient independence, the glory of the farmer's life, is to be gained in its greatest perfection on the small irrigated farm. Such a farmer finds much added to his life. New and broader activities and interests easily come to him and new room for skill and ambition in his calling.

It would be well for the intelligent California colonist to early make as thorough a study of the history and methods of irrigation as his convenience will allow. He may get along very well in his new home by following the practice and advice of his neighbors, but he will be more successful if he studies the science of irrigation in relation to soils, crops, methods, etc., and particularly with reference to his own, for, of course, much of the success with irrigation must depend upon the skill with which it is used, and he can find many interesting practical problems that concern him and his fields. The ways to such knowledge are not hard to find. From a broader standpoint, the whole great story of irrigation, "mother of institutions," as a factor in the world's civilizations, and particularly as a tremendous factor in the present and future of California, is well worthy of his interest. He may thus gain a larger and clearer conception of the potential greatness of the State whose future he has come to share, and he will more competently and readily take an intelligent citizen's part in solving problems and meeting tasks that are ahead for this great commonwealth, which is destined to develop the practice of irrigation to a perfection never before reached and to found a matchless civilization largely on the intelligent use of a peerless water supply.

California's Water Supply For Irrigation

S. G. BENNETT, Engineer United States Geological Survey

The proper solution of the irrigation question is the greatest economic problem now before the people of California. The water supply is the most important factor in the solution of this problem. The Hydrographic Branch of the United States Geological Survey has been making a study of the water supply in this State since 1895. On July 1, 1903, the State began to co-operate with the Federal Government in this work. There are now seventy-two gaging stations being maintained. The data being accumulated at each of these points has its specific value in connection with the future development of the magnificent resources of the State. The information will be invaluable in designing and making estimates of cost for storage, irrigation, power and drainage works, and for use in litigation. Its greatest value will be in determining the water supply available for storage and irrigation purposes.

Before giving some of the results of these stream measurements, an explanation will be made of the units used. The term "second-feet" (sec.-ft.) is an abbreviation for cubic feet per second. It is the number of cubic feet of water flowing by the gaging station every second. A continuous flow of one second-foot of water will cover one acre of land two feet deep every twenty-four hours. An "acre-foot" is the quantity of water it would take to cover an acre to the depth of one foot, or it is 43,560 cubic feet of water. This quantity is used in making estimates for irrigation projects, for giving the annual run-off of streams and in expressing the storage capacity of reservoirs. This is also a convenient term for use in stating the duty of water, or the depth of water necessary to irrigate an acre of land during an irrigation season. For instance, if it is known that two acre-feet are required per acre in one irrigation season in a certain locality, and the capacity of the storage reservoirs in that vicinity is stated in acre-feet, the amount of land that can be irrigated from the reservoirs is readily obtained.

The principal part of the flow of the streams tributary to the Sacramento occurs during the winter or rainy season, when the water is not needed for irrigation. This is true in a less degree of the streams tributary to the San Joaquin River. The crest of the Sierra Nevada, where these streams have their source, is generally higher than that part of the range where the tributaries of the Sacramento River rise, and more of the precipitation is in the form of snow. This snow is melted in the spring and early summer, and sustains the flow of the streams when the water is most needed for irrigation. The maximum flow of the Colorado River comes nearer coinciding with the season of greatest need for irrigation than any other stream in California.

These facts will be illustrated by the following table:

Table Showing the Four Months of Greatest Run-off for Six California Streams and the Percentage this bears to Total Annual Run-off.

STREAM	Length of Record used.	DISCHARGE IN ACRE-FEET								Total for four months of greatest flow in acre-feet.	Percentage of total mean annual flow.
		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST		
SACRAMENTO	9 years	1,189,600	1,551,400	1,594,800	1,033,700	.....	.....	.....	.....	5,419,500	55%
TUOLUMNE	9 years	.....	.....	198,700	290,600	455,300	398,400	.....	.....	1,343,000	71%
SAN JOAQUIN	7 years	.....	.....	.....	246,200	488,900	463,100	166,600	.....	1,364,800	71%
KINGS	9 years	.....	.....	.....	217,500	473,400	463,300	144,300	.....	1,298,500	75%
KERN	8 years	.....	.....	.....	86,100	135,800	113,400	57,800	.....	393,100	65%
COLORADO	3 years	.....	.....	.....	.....	1,996,200	2,766,600	1,497,300	659,900	6,920,000	71%

The run-off from the watershed of the Sacramento River for the months of April, May, June and July is less than 28 per cent of the total for the year. The above table shows that the rivers of the San Joaquin Valley are better adapted for irrigation purposes than those of the Sacramento Valley. The latter must be supplemented to a great extent by storage reservoirs. Fortunately, nature has been more liberal in providing natural basins suitable for convertion into storage reservoirs in the Sacramento drainage area than in the San Joaquin. The Geological Survey has been surveying these reservoir sites, and to date has surveyed sites in this basin that have a total storage capacity of 5,002,700 acre-feet. Stream gagings are being made at practically all of the

dam sites to determine how much of this storage capacity can be utilized. Numerous reservoir sites also exist in the San Joaquin Basin, many of which have been surveyed and their capacity determined. The most important of these are located in the Kings and Tuolumne River Basins. The water from Kings River, increased by the supply that could be made available by building storage reservoirs known to exist, would irrigate double the amount of land now irrigated from this stream.

Sacramento Valley, with its 2,661,120 acres of land of unsurpassed fertility, its equable climate, its large water supply, its great range of high-priced agricultural products, its proximity to markets, and its transportation facilities, presents the greatest latent opportunity for irrigation development in the West. If to this be added the 7,386,000 acres of irrigable land in the San Joaquin, making a total of more than 10,000,000 acres for the great valley of California, it is doubted if the irrigation possibilities from an economic standpoint are surpassed in the world. In addition to this, the water supply is such that large tracts of land can be irrigated in the Salinas, Pit River and Shasta Valleys. The irrigated area can be increased in the Owens River, Honey Lake and Colorado River Valleys.The water of the Colorado River is particularly well adapted to irrigation on account of the large amount of fertilizing silt which it contains.

The irrigated area in California will be largely increased by the economical use of water.

As lands are brought under irrigation the duty of water will increase, and the irrigated areas will be extended as the water plane is raised. In some localities it will be necessary to keep down the water plane by pumping. This ground water can be used for irrigating other lands.

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NOTE.—For the information of those who wish to study the water supply of the State in detail, reference is made to the following Water Supply and Irrigation Papers, published by the Geological Survey:

No. 45. Water Storage on Cache Creek, Cal., by A. E. Chandler.
No. 58. Storage of Water on Kings River, Cal., by J. P. Lippincott.
No. 81. California Hydrography.
No. 86. Storage of Water on Stony Creek, Cal., by Burt Cole.
No. 89. Water Resources of Salinas Valley, Cal., by Homer Hamlin.

Progress Report on Hydrographic Investigations in the Sacramento Basin, by S. G. Bennett. This latter is soon to be published.

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CALIFORNIA'S STATISTICS OF PRODUCTION FOR 1904

Gold	$18,970,000	Fresh fruits—pounds	425,000,000
Silver	1,280,000	Wine—gallons	29,750,000
Petroleum	19,896,702	Wheat—bushels	15,862,500
Quicksilver	1,534,220	Barley—bushels	23,683,360
Copper	4,105,000	Oats—bushels	5,120,000
Other minerals	5,105,000	Corn—bushels	1,640,000
Raisins—pounds	75,000,000	Hay—tons	1,965,000
Figs—pounds	5,000,000	Potatoes—bushels	6,147,500
Dried fruits other than prunes —pounds	49,260,000	Asparagus—pounds	22,370,000
Prunes—pounds	125,000,000	Beans—pounds	115,500,000
Canned fruits—cases	2,830,000	Butter—pounds	35,636,969
Olive oil—gallons	45,000	Cheese—pounds	6,133,898
Pickled olives—gallons	60,000	Beet sugar—pounds	109,600,000
Oranges—boxes	11,287,216	Hops—pounds	11,780,000
Lemons—boxes	1,128,600	Lumber—feet	814,250,000
Nuts—pounds	16,650,000	Honey—pounds	2,640,000
		Brandy—gallons	1,265,000

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BUILDING CONTRACTS FOR JANUARY

The building contracts in San Francisco for January, 1905, were as follows: Frame, $719,706; brick, $1,492,679; alterations, $53,309; total, $2,267,694.

* Complete returns on minerals may show an increase. Gold has also been estimated at $19,500,000 and silver at $1,533,316.

Irrigation By Pumping

JOSEPH JACOBS, United States Reclamation Service

In the popular mind, irrigation implies a gravity or surface—catchment system for delivering water to the land, but in recent years pumping has come more and more to be recnized by engineers as a legitimate and profitable means of supplying water for irrigation, and it is destined to grow in importance with the development of cheaper power. Lands that lie beyond the economic scope of gravity supplies are often entirely reclaimable by pumping, and numerous cases are of record where both systems being available, the advantage as to first cost and to operating expense has been with the pumping plant.

Although taken up seriously by California only within the past few years, irrigation by pumping is by no means a new art.

Windmills have been used extensively owing to their ease of installation and their almost negligible operating expense. They should be used only where a comparatively regular wind can be depended on, and for greatest economy should be supplemented with storage reservoirs or tanks to conserve the full capacity of the mill during hours and days when no irrigating is done. The mills in common use are 12 to 16 inches in diameter, and, depending on the lift, will pump sufficient water to irrigate from one to three acres of land without storage or from three to nine acres where storage is provided. Their first cost of $30 to $40 per acre irrigated makes them applicable to the irrigation of small areas, but it is believed that with larger and more powerful mills grouped about ample reservoirs and where proper wind conditions prevail, they can be made to compare favorably with the more approved types of pumping plant.

Of the many types of pumps available and in use the most common is, perhaps, the centrifugal pump. They are made on the coast in standard sizes, ranging from 2 to 15 inches for diameter of suction and discharge pipes, and on special order can be made any size required. The first cost will depend on size of plant and type of motor used. For small plants capable of serving 100 acres or less. the first cost has usually been $12 to $15 per acre, and operation and maintenance from $2 to $3 per annum per acre irrigated. For larger plants the relative cost has been materially lower.

A recent estimate made by the United States Geological Survey for an extensive pumping system to serve some 300,000 acres of land in the San Joaquin Valley, indicated the first cost of plant to be about $4 per acre and the annual cost of operation and maintenance to be about 50 cents per acre-foot, or say $1 per year per acre irrigated. When it is borne in mind that the average cost of installation of gravity supply systems in California has been about $13 per acre and the average annual charge for irrigation $1.60 per acre, the great possibilities of pumping can be appreciated.

The gasoline engine has proven very efficient and cost per acre by this method should not exceed $6.00 per year, an entirely economic figure for valuable fruit crops.

With the present price of fuel oil, the cost per acre irrigated with steam power should be from $1.50 to $3.00 per year for lifts ranging from 25 feet to 70 feet.

The utilization of our mountain streams for the development of hydro-electric power plants has in it the most potent promise for the extension of irrigation by pumping. With the present commercial rates for electric power and the low lifts that very generally obtain throughout our interior valleys, the cost of pumping by this system should rarely exceed $1 per year per acre.

The scope of this article will not permit a review of the extent to which pumping is already practiced in this State. There are, however, numerous plants operating, as, for instance, in the Santa Clara Valley, where there are about 2000 plants, most of which have been installed within the past five years; in the Woodland district, where nearly 1000 acres have been brought under cultivation by pumping; in the vicinity of Corning, at the northern end of the Sacramento Valley, in the San Joaquin Valley, and very extensively in the southern part of California, where unusual energy has been displayed in conserving the water supply, it is estimated that they have installed sufficient pumping capacity to increase their supply by some 20,000 miner's inches, thereby saving to themselves and to the State valuable orchards which would otherwise have perished.

Considering the available supply of cheap fuel and the numerous electric power plants now developing, probably in no place in the arid west are conditions so favorable for economic irrigation by pumping as in California.

Cost of Pumping Plants

MRS. A. J. KANAGA, Editor Farm and Irrigation Age.

It is with pleasure that I submit the following on irrigation pumps, methods, cost of operating, etc., for the Irrigation Number of FOR CALIFORNIA.

The following figures may be of interest:

Cost of operating per day of ten hours, 80 cents to $1.00.

Cost of installing plant, $12.50 per acre.

Cost of putting water 12 inches deep on 80 acres, 60 or 75 cents per acre.

A letter from Mrs. H. L. Davis of Salinas, Monterey County, will be interesting to your readers. She says in part:

"I am now irrigating 483 acres of land. I have 300 acres in sugar beets and 100 acres in potatoes and 80 in beans. My object in writing is to tell my experience in irrigating with a pumping plant. I have two artesian wells 150 feet deep and with one 22-horsepower engine I irrigate this whole piece of land and also 150 acres of a neighbor's. I contemplate buying another engine in the spring and will then irrigate more land."

Another letter, from Mr. Al Griffin, says:

"I am using a 12-horsepower distillate engine, with 6-inch pump, to irrigate 80 acres of raisins. The original cost of my plant was $1000. It has a flow of from 900 to 1000 gallons per minute, with a total lift of 30 feet. I could irrigate 150 acres with this plant."

MEASUREMENTS

One miner's inch of water equals 9 gallons of water per minute California measurement, or .02 cubic foot per second. This amount will cover ten acres, 1.45 feet, or practically 1½ feet deep in one year running of water.

Four hundred gallons per minute equals 44 miner's inches and will cover 88 acres 12 inches deep in 100 days running twelve hours per day; for 10-foot lift, 2 horsepower, 20-foot lift, 4 horsepower.

Sixteen thousand gallons per minute equals 177 miner's inches. This will cover 353 acres of land 12 inches deep, running 12 hours per day. Lift of 10 feet, 8 horsepower; lift of 20 feet, 16 horsepower.

STEAM PLANT

One thousand acres of land, capacity of pump 4500 gallons per minute, approximated horsepower 40. This pump will cover 1000 acres 12 inches deep in 100 days, running twelve hours per day—being a twenty-foot lift for water. If the water required a ten-foot lift it would take only one-half the horsepower.

The cost per horsepower for ordinary plants usually ranged from $50 on small plants to as low as $25 on large ones.

COST OF FUEL

Fuel oil at 2 cents per gallon to irrigate 1000 acres, 20-foot lift, $510 for oil, being approximately 50 cents per acre. Cost of installing this plant would be from $2500 to $3000. This will require from two to three gallons of Bakersfield fuel oil per horsepower per hour. For ordinary slide valve engine. Fuel can be reduced with a condensing engine and high efficiency equipment. To 1½ to 2 gallons per horsepower per hour. (Water here was pumped out of a river.)

* * * * *

THE BROWN FAMILY IN CALIFORNIA

Owing to the general interest in irrigation and its importance in this State, the editors of FOR CALIFORNIA decided to omit the usual installment of the Brown Family in this issue. But the genial New Englanders who have cast their lot in California will greet our readers through the March number of FOR CALIFORNIA.

It is believed that this Irrigation Number will be of great good in affording definite information by authorities on irrigation.

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VEGETABLE GROWING IN CALIFORNIA ALL THE YEAR ROUND.

VEGETABLE growing offers opportunities in California as an all-the-year-round pursuit. While there are "best planting" months and "best harvesting" months for the various kinds of vegetables, yet in the valley and foothill regions of the State many of the well-known vegetables can be planted or harvested any month of the year. Indeed, it is not too much to say that no one who lives in the country in the valley and foothill regions of California should ever buy vegetables for his table. He can get his cabbages, his radishes, his turnips, his onions, his peas and his lettuce fresh from his own garden at any time of the year. Many other vegetables he can get fresh from his own soil in months when they are impossible or sold at prohibitory prices in other states. For the man who cultivates the soil in California the vegetable garden is a great help in supplying the family table and besides this a small area well tilled with regard to getting choice vegetables on the market at the time when they are greatest in demand will add appreciably to his bank account and return a more immediate income than almost any branch of agricultural occupation in which he could engage.

Because of its unusual opportunities for continuous agriculture over a vast extent of country California will some day become the producer in vegetables for the whole West. Regarding the opportunity for continuous vegetable growing attention is specially called to climatic conditions in California—the climate of California is not determined by the distance north or south, but by altitudes and the distance east and west. The climate of California is unique in this respect, Geography does not necessarily indicate climate in California, as it does upon the Atlantic seaboard. The United States Weather Bureau, at the suggestion of the California Promotion Committee, has decided in its forecasts to divide the State in valley, mountain and coastal districts instead of north and south districts, as heretofore. This will be a great advantage to the whole State of California. Inquirers will get a better idea of the region in which they propose to locate, in whatever part of California that region is situated.

VEGETABLE GROWING IN CALIFORNIA.

There could be no greater recognition of the fact that California has an all-the-year-round growing climate than this action of the Weather Bureau. What is known to the Weather Bureau as the "Orange-Growing Thermal Belt" extends from San Diego on the south almost to Mount Shasta on the north, a distance of nearly seven hundred miles. The mean annual temperature in this belt is between 60 and 70 degrees Fahrenheit.

Of course, your vegetable garden must have the same care that it would in other States. One can grow vegetables the year round because the climate permits it, because proper soil may be selected, and because irrigation can take the place of rain at a period in the life of the plant when rain would naturally fail in other countries.

An all-the-year-round growing season suggests constant use of the ground and the possibility of turning the soil over several times in the course of the year. This can be done by quick revolution like the following:

Where water is handy, two, three, or even four crops can be grown on the same ground in the year. Start April 1st and sow the plot to lettuce, and with proper cultivation it will mature in two months. Resow with turnip or radish, which is a good summer variety. These will be fit to use in three weeks, or by the first week of July, when the ground will be ready for late cucumbers, which will occupy the ground until the first frost, or till the nights become too cold for them to fruit. Now plant to carrots, beets or onion sets, and any of them will be ready for use in February or March. Here we have four crops within the twelve months, and no two of them occupying the ground at the same time. There are other combinations that would do as well.

Though this rapid work is quite feasible, as shown, and many plants can enter into such combinations, the two crop plan will probably be as fast movement as most farm gardeners will keep up with, and that consists in fall sowing of hardy vegetables for winter and spring use, followed by spring planting of tender vegetables for summer and fall use. Occasionally there will be intervals in this rotation for a third or catch crop of lettuce, radish, etc., which takes a very short time. This will be a vast improvement on the present popular conception of gardening possibilities, and if the hint of a fall crop of tender vegetables, like melons, beans, corn, etc., planted in July to come on fast in the heat, followed by fall planting of the hardy list for winter use, these two crops will be gained before the outbreak of the usual "garden fever," which rallies all garden forces in February and March. The agencies to demonstrate this broader conception of our gardening possibilities are will and work and water.

TEMPERATURE AT WHICH CERTAIN PLANTS ARE LIABLE TO RECEIVE INJURY FROM FROSTS.†

PLANT	DEGREES FAH.	PLANT	DEGREES FAH.
Asparagus	29	Beans	31
Cantaloupes	32	Celery	28
Cucumber	32	Onions	28
Potatoes	30	Sweet Potatoes	31
Spinach	21	Squash	31
Turnips	26	Watermelons	31

†—From "California Vegetables," by Edward J. Wickson, Professor of Agricultural Practice in the University of California; published by the Pacific Rural Press, San Francisco.

REALTY SALES IN FEBRUARY.

During the month of February, 1905, the realty sales numbered 646, and the total value represented was $4,075,442. This record of sales has never been equalled in February since 1867 (shortly preceding the completion of the transcontinental line—1868), and the closest approaches to the sales were in February, 1875 and 1903. The sales of February of this year show an advance over the preceding month by $1,140,317.

A Box of Seeds in California.

By A LETTUCE SEED.

I LAY with a number of other seeds of our relations, the Lettuce family, in a box in the window of a grocery.

It was a warm February day in California, and the sun shining through the window and upon my package, stirred within me the impulse to be in the ground and growing. A little girl came into the grocery, and I heard her telling the grocer:

"Mamma wants some vegetable seeds; something that will start growing right away."

My, how my tiny self palpitated at that! "I hope she will buy me," I thought, but then probably every other seed in the box thought the same thing. And there were thousands of seeds in that box.

All the seeds were gathered together in packages and each package was placed in a neat little niche nicely designated by a red and black label.

"Well, what does your mamma want?" said the grocer.

"I guess I don't remember," said the little girl, "but it's in my pocket," and she tugged away at her apron.

Presently she brought out a slip of paper.

"No matter; here your mamma comes," said the grocer.

"Now," said the little girl's mother, "we have a little plot of about fifty feet square, and I want to have some vegetables planted that will grow right away."

"That's very nice," said the grocer, who liked to chat, and who knew his neighbors well. "I just planted some California seeds and they are beginning to grow finely. Always buy California seeds, ma'am, for they come from vegetables that are raised here and so these seeds become vegetables that are strong and are used to the climate."

"My, is that so," said the little girl's mother.

"Yes, indeed, ma'am," replied the grocer. "I might say that California raises more vegetable and flower seeds of high quality than any other State."

"Well, I'll take California seeds, and what do you think I'd better take?"

Now, all this time I was just trembling with eagerness in my package in the third tier, and if only I could have spoken I would have cried out:

"Take lettuce seeds. We can be planted any month in the year and we grow very nicely if you irrigate us with a little water."

But the grocer wanted to tell a story, so we all had to wait until it was finished.

"I just read of a fruit grower," he said,"who says that his garden of fifty feet square supplies enough vegetables, excepting potatoes, for a large family, and requires less than half a day's attention during a week."

"Well, that's very interesting to me, because my garden will be fifty feet square, too," said the little girl's mother. "What does he grow?"

The storekeeper slowly unfolded a newspaper from his vest pocket and read from it: "He grows the following vegetables and he plants them each month in the year on his fifty feet square, as follows:

January—After the 20th, turnips, cabbage seed, carrots, lettuce, peas.

February—Radishes, beets, salsify, spinach, onion seed or sets.

March—Potatoes (in field), turnips, cabbage, lettuce, peas, cabbage plants.

April—Cucumbers, watermelons, muskmelons, squashes, tomato plants, radishes, beets, salsify, corn, beans, sweet potatoes, cabbage seed.

May—Carrots, lettuce, peas, onion seed or sets.

June—Radishes, beets, beans, corn, salsify, cabbage plants.

July—Carrots, lettuce, cabbage seed.

August—Potatoes (in field), corn, beans, radishes.

September—Cabbage plants, peas, turnips, salsify and carrots.

October—Beets, beans, onion sets, lettuce.

November—Turnips, spinach, salsify.

December—Winter radishes, peas, lettuce.

"Now, this man is located in a district where there are some frosts," said the grocer. "But the period of frosts is very short and they are light ones at that. He plants in rows eighteen inches apart, irrigates his garden every ten days in trenches, and cultivates twice a week. In favorable seasons he has natural moisture from November till April or May. If the rainfall is light, he cultivates twice a week."

" Well, I don't suppose that I will have the success that he had because I haven't had the experience. We are just beginning, because we want to raise our own vegetables," said the little girl's mother.

"These are all good seeds, ma'am, and you are almost sure to have success," said the storekeeper.

"The man I just read you about planted certain seeds in certain months because he had in mind crop rotation. But there are other seeds than those given that can be planted in the different months, and the rotation can be considerably varied, all depending largely on what vegetables you want from your garden at any given season of the year."

"Now among the vegetables you can plant in February or March to good advantage are beets, cabbage, carrots, cauliflower, celery, lettuce (which can be planted any time of year), onions, peas, sweet potatoes, radishes, salsify, and turnips. I have given these few because they are adapted to the valley and foothill ranges throughout California. But in this locality you can plant tenderer vegetables like sweet corn, tomatoes, cucumbers and vegetables."

"Well, please give me some lettuce seed, peas, sweet potatoes, radishes, cabbage and beets," said the little girl's mother.

So it happened that the package in which I lay was wrapped up with other packages and given to the little girl to carry.

"Well, thank you ever so much," said the little girl's mother, "when I have any seeds to buy I shall buy them of you."

And so we hurried away to the garden for she said, "Now I know that these seeds are as eager to be planted as I am to plant them."

Which was quite true.

Note.—While in the form of a story the facts here given are authentic. The names of the two growers mentioned are those of actual persons.

The Market Gardens of South San Francisco.

MARKET GARDENING is an industry whose value is exemplified in many parts of the State. A unique and most interesting example of California market gardens and of some of the vegetables that grow in California all the year round may be seen in the market gardens of South San Francisco.

Here is almost another Holland, so intensively is the ground cultivated. Great Dutch windmills with huge wooden arms pump the water, which flows in neatly constructed laterals or ditches along the terraces, which, like broad steps mounting upward from the center of the valley, comprise the vegetable patches.

Twenty minutes' ride from the center of the city on the Mission-street car (the one marked "cemeteries") brings one to these unique gardens, where there is planting and harvesting all the year round. Thence the gardening stretches down a valley eight miles or so in length, way down to Halfmoon Bay, and further still—practically to San Jose.

"Isn't this land mighty valuable?" you ask. "How can it be devoted to market gardening while fairly within the limits of a great city?"

Of course it is valuable—very valuable. One man I met pays ten dollars a month per acre for the rental of this land. In all he has fifteen acres of land and it costs him one hundred and fifty dollars a month just for the use of it. He employs seven men and pays them good wages. Naturally market gardening must pay, otherwise this gardener could not afford to lease land at such a price as this. The land in this little Holland, right in the suburbs of San Francisco, is, I am informed, worth from one thousand dollars an acre up. Yet there is demand enough for vegetables to make it worth while to devote it to this use.

This is why the market gardens of South San Francisco are interesting. They make a commercial showing for the industry. The ground is well adapted to market gardening and the gardens are not located so far distant that their produce cannot easily be taken by wagon to the public markets in the heart of San Francisco.

Of course South San Francisco is only one of the many cities of California which support market gardens.

I want to say that I did not see one glass pane,

no hothouse, nor any artificial means of plant propagation in this terraced valley, with its Amsterdam windmills.

There were growing on Washington's Birthday, 1905, such vegetables as young peas, lettuce, artichokes, cabbage, beets, radishes and others which those of us not of California, are more apt to associate as belonging to the summer months than to February.

Some of the artichokes have brought as high as seventy-five cents apiece, some only ten cents apiece, while others are sold by the dozen. Then there is lettuce which has often brought between ten and twenty-five cents a dozen. The beds themselves are about twenty feet long by twelve feet wide. The luxuriance and vigor of the plants seemed almost phenomenal. The artichokes seemed to be "growing like weeds," as some one expressed it.

THE AGRICULTURAL EXPERIMENT STATION AT CHICO.

By Professor P. H. Dorsett
in Charge.

The California Promotion Committee,
San Francisco, California.

Gentlemen:—The following is an outline of some of the more important immediate plantings at the plant introduction garden, preparatory to demonstration experiments, and to the work of plant breeding and selection.

CEREALS.

Some of the highly nitrogeneous barleys will be planted to determine if possible their value for feeding purposes as compared with the sorts in general cultivation. In as much as a heavy yielding barley is always of great interest, as well as economic value to the farmer, it is possible that one of the selected barleys of Prof. Willet M. Hays, formerly agriculturist in the Agricultural Experiment Station of the University of Minnesota but recently appointed Assistant Secretary of Agriculture, which has shown remarkable yielding qualities, will be planted to determine its value in California.

FORAGE PLANTS AND GRASSES.

These plants especially new introductions and originations will receive more or less attention and will be tested in comparison with those already in general cultivation.

It is possible that Vicia sativa, which has proved so successful in Oregon on heavy clay soils might be equally as successfully grown upon the adobe lands of this State.

JUNCUS EFFUSUS.

JUNCUS EFFUSUS (CALIFORNIA RUSH).

In view of the fact that the California rush which grows on the tule lands is so promising for matting material, that Mr. Sawyer, of the Boston Matting Manufacturing Company, has written that they would start a factory in this region provided the California rush by cultivation can be made equal to the Japanese. The office of Seed and Plant Introduction has taken up the matter of collecting a quantity of the roots of the several species, to determine the best method of propagation, growing, etc. Plants and seeds of the best known varieties in Japan will be introduced to test in connection with the native species and for breeding and selection experiments. This work will be co-operative with the State Experiment Station.

ALMOND.

Almond growing is one of the important industries of the State, but is fraught with uncertainity and frequently immense loss; all of which could be avoided, and the industry be made an exceptionally paying one, provided a late blooming variety of good quality can be secured. With these ends in view, as many varieties of almonds as possible will be secured and established at the garden. The Jordan, a very recently imported Spanish hard-shell variety, of excellent quality, will be tested and although it may bloom too early to be profitable, its qualities will be useful in breeding experiments designed to produce later flowering almonds of good quality.

UDO SALAD PLANT.

Myoashi Udo salad plants will be planted at the garden this spring, for propagation, in order to obtain a supply with which to experiment and also to call the attention of the vegetable growers of California who may be able to take up the cultivation of these plants and make a market for them in this vicinity.

Arrangements have already been made with a company in Seattle who can and will doubtless give the plants a fair trial. One of the largest vegetable and fruit shippers of Washington State is interested in the plant and in exploiting it, and believes he can grow it successfully.

Udo is a Chinese winter vegetable, its season is October to May. It is of recent introduction, Mr. Fairchild speaks of it thus in Bulletin No. 42: "The slices of Udo are crisper than slices of celery and have none of the objectionable stringy fibers of the latter. They have a fresh taste, like the midrib of a lettuce leaf, with slight but most agreeable suggestion of pine flavor. The tenderest young shoots of celery could not be more brittle than these blanched stems of udo." On account of its adaptability to winter culture and its excellent quality it should become as popular as celery or asparagus. It would appear from the description of this plant and the methods of culture, as outlined in Bulletin No. 42, Bureau of Plant Industry, that this vegetable might prove a valuable acquisition for the reclaimed lands of the Sacramento and San Joaquin.

JAPANESE PAPER PLANT (EDGWORTHIA PAPYRIFERA.)

For a description of this plant, the variety, extent and value of paper made from it in Japan, I refer you to Bulletin No. 42, Bureau of Plant Industry. We have a quantity of seed of this plant at the garden, which will be propagated for testing, possibly in the Sacramento and San Joaquin valleys, the Colorado Desert, Florida and Louisiana.

MISCELLANEOUS FODDER PLANTS.

It is proposed to propagate and test miscellaneous fodder plants from all parts of the world. Live stock husbandry is, and will continue to be, one of the leading industries of the country and it is important that we find and introduce or produce, if possible, forage plants suited to the varied climatic and soil conditions of our country.

PISTACHE.

We have a quantity of seed and from four to six thousand young plants of this excellent nut at the Plant Introduction Garden, which are being propagated for experimental work. There is every reason to believe that, in this, a new industry of considerable importance will be established in the State. It has been said that it is possible that the cultivation of the pistache may supplant that of the almond, in as much as it is believed to be a surer cropper and thrives equally well on soils as dry, if not dryer, than those utilized for almond culture. It is believed by those who have given attention and a vast amount of study to this subject that the Sacramento Valley presents conditions especially adapted to the cultivation of the pistache.

FIG CULTURE.

The garden is in possession of one of, if not the, finest and most extensive collection of figs in the country, to which additions will be made whenever it is possible to find new varieties. Permanent plantings of the varieties will be commenced this spring and in a reasonable length of time the experiments in connection with selection, breeding and testing of varieties can be taken up; much is yet to be accomplished in connection with this industry.

GRAPES.

Co-operative experimental work is being arranged for that, when completed, will eventually result in assembling at the garden for experimental investigation, breeding and selection work, possibly every known variety. It has been estimated that there are possibly 1500 to 2000 varieties in various parts of the world. As the viticultural interest of the State represent possibly $100,000,000, this work will, no doubt, be of great interest and it is hoped and expected will result in immense value to an industry already menaced by diseases and other pests.

I might continue this discussion indefinitely, including as it does plant growth of all kinds, having or likely to have economic value to this country. But trust the above is sufficient to indicate the importance of the location and establishment of the Plant Introduction Garden in California.

I desire to call your attention to the fact that from the very nature of the work important results in too short a space of time must not be expected. Some problems may and no doubt will be easy of solution, others, however, will require the patience, perseverance and work of a life time or even longer for demonstration.

Please, therefore, do not feel disappointed in case immediate results do not follow all the lines of investigative work. Trusting that the above will meet your needs in this connection, I remain,

Very truly yours,

P. H. DORSETT,
In charge.

MR. J. W. ERWIN GOES EAST.

Mr. J. W. Erwin, Special Commissioner of the State Publicity Committee of the California Promotion Committee left for Chicago on March 2nd. Mr. Erwin will deliver a series of lectures on the cities of California, illustrated with stereopticon views, at the International Loan Exhibit of the Chicago Municipal Museum. At this exhibit which closes March 20th, cities from all parts of the world will be represented.

Upon his return from Chicago Mr. Erwin will make a three months' tour of California repeating his lectures and stereopticon views and gathering new material.

EASTERN HOTEL MAN FINDS CALIFORNIA LITERATURE INTERESTING AND INSPIRITING—A LOT OF GOOD KENTUCKY PEOPLE INTERESTED IN THIS STATE.

The California Promotion Committee has received the following letter from Pike Campbell, proprietor of the Fifth-Avenue Hotel, Louisville, Kentucky:

"I beg to acknowledge receipt of your favor of the 31st ult., together with publication FOR CALIFORNIA, and I think it is a splendid way to advertise your resources, as you put your advertising in quite an attractive form. If you desire to send these publications to me monthly, I would take great pleasure in placing them before my guests, and I do not doubt but what your method will eventually result in an increase of immigration to California. A great many Kentucky people locate in that country every year, and with your regular and persistent publishing of your present form of advertising, I bespeak good results for you. I find your reading matter quite interesting and inspiriting. If you keep the standard of matter up to that of the issue I have just read, you will be sure to create a great deal of confidence throughout the country.

"Wishing you every success in your undertaking, I remain,

"Yours truly,

(Signed.) "PIKE CAMPBELL."

The Committee has placed its monthly publication FOR CALIFORNIA, and many of its other publications, in the reading rooms of the hotels throughout the United States and on the limited trains.

A home that does not have plenty of fresh fruit and vegetables, as well as home-canned things, falls far short of the ideal.

FOR CALIFORNIA BROUGHT A BAKERY.

FRUITVALE, California, 1905.

California Promotion Committee, San Francisco, California:

Gentlemen:

I acknowledge receipt of pamphlets on River Improvement and FOR CALIFORNIA, for which our Board of Trade is most thankful.

Our next meeting will take place on next Tuesday and all of your late communications will be read and will be acted upon.

The members of our Board feel much flattered for your kind attention in keeping us in touch with all the doings of the California Promotion Committee. We shall cooperate in our humble way in aiding all movements deemed profitable for California.

The September number of FOR CALIFORNIA has brought us in Fruitvale a baker now actually engaged in bread-making. It is the first bakery of the kind started in Fruitvale; heretofore bread supply came from Oakland.

Thanking you for your interest shown in us, I remain,

Yours very truly, (Signed.) J. L. DUMONTIER,
Secretary Board of Trade of Fruitvale.

UNIVERSITY OF CALIFORNIA

The Brown Family in California

By JASON BROWN

CHAPTER TWELVE

IN WHICH MEANS OF PROTECTION TO VEGETABLE GARDENS ARE SET FORTH BY WILLIAM SIMPSON.

"WHO is this Professor Holden of Iowa?" asked William Simpson, stretching his six feet two out on a log and pulling his hat comfortably over his eyes.

We were picnicking on Rock Creek; it was Washington's Birthday; one of those lovely afternoons which we have frequently of a late February in California.

Professor Bradshaw, head of the public schools in Kinney's Corners, who keeps posted on current events, now asserted his position as spokesman in matters of the wider knowledge.

"Professor P. G. Holden of Iowa is the greatest expounder of the doctrine of seed-corn selection," said the good school-master, tapping the end of a hard-boiled egg and sprinkling on a little salt. "Professor Holden is the man who helped to increase the corn output of Iowa ninety-three million bushels in one year. In a single year he increased the corn crop sixty-four million bushels over the average production of fourteen previous years."

"How did he do it?" asked Mrs. Simpson.

"I was just coming to that," said School-master Bradshaw, gratified with the impression he had made. "He did it by showing the farmers of Iowa the difference in production from good seed and bad. He proved the success of the seed-corn theory in a series of experiments at the Iowa Agricultural College. Last spring he visited about thirty farms near the college, taking samples of the various seed-corn that the farmers had. He planted these samples in one field, so that the conditions of soil, weather and treatment would be equal. The yield in the fall ranged from thirty-five to seventy-five bushels an acre and the proportion of seed that grew—ahem, I might say germinated—varied from ninety-eight per cent to less than fifty per cent. This showed that had care been exercised in selecting and planting the seed-corn the yield would have been a uniform seventy-five bushels to the acre. The difference between the good and the bad seeds had cost the careless farmers fifteen dollars an acre on one year's crop."

"Isn't that great?" said Simpson. "He reached right out and discovered something so simple that nobody had ever thought of it before."

"The value of his experiments to humanity are incalculable," declared the School-master, pompously.

"I s'pose it was necessary to grow a lot of corn to see what seed would give the best corn crops on the different farms," said my wife.

"Yes, indeed, Mrs. Brown," replied Professor Bradshaw. "The experiments were conducted with the view of ascertaining the varieties adapted to various conditions of soil and climate, the size and the quality of the yield."

"Yep, he did good work, all right," said Simpson, "and I see that the United States Department of Agriculture is beginning to follow out his lines. It's a good line to follow in California, and everywhere else, too."

"I remember back in New England, father always used to select the best seeds he could. I don't know that any one ever went to the extent of experimenting. They just kept as close as possible to the best that was done in their locality."

"And that is a mighty sensible thing to do," said Simpson. "That's just what Jason here has done. He's gotten together all the local knowledge and applied all the best of it."

"You bet my pa has! He's got the best vegetable garden there is. That's what a professor of the University who came down here to the Farmers' Institute says, anyhow," maintained Robert, stoutly.

"If it is good, it's because my good neighbors weren't afraid to suggest anything for fear it might hurt 'em to give away a good idea," I said.

"Now, Jason, if that's the case, it's fair for you to turn about and tell what you've done in your vegetable garden," put in jolly Mrs. Simpson.

"Well, when Neighbor Simpson, here, found me thinking what steps I must take to make our farm immediately productive, he suggested, among other things, to raise a little garden truck. That was a year ago. I put some garden truck—relishes like lettuce and radishes—in the old orchard and some larger vegetables, like potatoes and onions, on a low hillside, with southern exposure. Now, as Mr. Simpson is largely responsible for my garden, and as he wants to talk—"

"All right," broke in the genial Simpson. "I won't say much about what you planted, but rather how you equipped your garden and about your methods. February is a good planting month in this neck of the woods, so you rightly did your planting then. But while doing your planting you diverted your irrigation ditch to protect your garden. You lead a stream of water on all sides of your garden, so that it not only served to keep away many pests, such as grasshoppers and other insects, and moles, and perhaps some larger animals, but made water easily obtainable at any point, as well as giving irrigation by absorption—the very best kind of irrigation.

"I might say that, in general, there are four kinds of protection one must figure on for a garden—protection against winds and possible frosts, against injurious insects, against injurious fungi, and against destructive animals and birds. These are a lot more formidable than they seem, for though they keep a man on the jump, yet if he is on the jump they won't get very far ahead of him. Naturally a ditch is a good barrier to lots of animals and insects. A wire or close board fence, too, is good to keep our such animal pests as rabbits, but Jason did not find a fence necessary.

"A windbreak is a good thing to include in your preparations for the garden. There are very few places where a good windbreak will not be of decided advantage, and if the garden ground cannot be selected so as to enjoy the protection of trees and buildings already in place, special planting or construction should be undertaken. A good shelter belt of trees, preferably of green foliage, placed in position to break winds that may prevail, is of advantage. Where such protection is not practicable a high fence, even if not closely boarded, will afford some protection to a much greater width of ground than one might think at first. Jason didn't need a windbreak in the orchard, but he wisely planted a hedge of evergreens above his hillside patch."

"Give us a few points about protection against insects and fungi, Mr. Simpson," asked the school-master.

Well, there are two kinds of insects—biting insects and sucking insects. The sucking insects make no holes, but pierce and extract the sap so that the leaf wilts and perhaps dies without losing any appreciable part of its surface. The way to get rid

of the pests that bite and chew is to poison their food, but the fellows that suck the juices and pay no attention whatever to poison on the outside surface of a plant, have to be met and slain in open battle. The biters are killed by a Paris green mixture and the suckers are laid low by the kerosene emulsion.*

"Another group of biting pests, though not strictly insects, are slugs and snails. They can be poisoned by the use of poisoned leaves laid on the ground or they can be trapped either with leaves or pieces of board or little piles of wheat bran. Early in the morning the slugs will be found in large numbers under the leaves or boards or collected in the bran, and can easily be gathered up for breakfast in the poultry yard."

"Mamma and I had a better plan than that to kill slugs; didn't we, mamma?" said Ethel. "We had the little chickens do it."

"That's first rate," said Simpson. "Mother hens in portable coops, with the young chicks running among the plants, are a very good solution of the slug question on a small scale. But a garden should never be troubled with myriads of slugs. When the slugs are found in great numbers it is often due to excessive surface irrigation. If the surface is finely worked up and allowed to dry, it is very discouraging to slugs and is otherwise promotive of plant growth."

"Now, Mr. Simpson, you put it as though we didn't know that," said Ethel, protesting.

"All right, Miss Ethel," said Simpson. "If you will allow me, I'll escort you over to the speech-making, for I hear Judge Gardiner just beginning a nice address on George Washington."

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*Note by Jason Brown: "Mr. Simpson didn't tell us what are the means for treating destructive animals, but I will say we've always found it necessary to trap gophers; poison ground squirrels, if there are any anywhere in the vicinity."—Jason Brown.

(To be continued.)

HOW TO MAKE KEROSENE EMULSION.

(The standard remedy for plant lice and some other sucking insects.)

Kerosene emulsion is made by dissolving half a pound of soap, and adding two gallons kerosene while hot; this must be churned hard until the two ingredients are thoroughly mixed, when it becomes a creamy paste. This must be diluted with twenty to twenty-five parts of water before it is sprayed on the stems and foliage of a plant. You can use one gallon of sour milk in place of the half pound of soap, and dilute in the same proportion before using.

HOW TO MIX PARIS GREEN.

(The standard arsenical poison, a wholesale way of killing insects that chew.)

Paris green and London purple are the two principal poisons used for chewing insects. To make a spraying solution, mix one pound of Paris green with 100 or more gallons of water; one pound of milk of lime prevents injury to leaves, and the latter should always be used when making the London purple solution, which is compounded in the same proportion as Paris green. To use them dry or in powder form, take one pound of either poison and mix with 50 pounds of flour or 100 pounds of land plaster, fine road dust or coal ashes. This can be dusted on the leaves through a coarse muslin bag or through a fine sieve. The London purple solution is the cheaper of the two and adheres to the foliage longer. Tobacco dust sprayed or blown onto the leaves and stems is also a remedy.

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The California Promotion Committee announces that orders will be taken for the first volume of FOR CALIFORNIA, comprising the issues of FOR CALIFORNIA from December, 1903, to November, 1904, inclusive. The volume has been handsomely bound in green cloth, stamped in gold, and will be sent to any address on receipt of $1.00. Besides containing the serial of the "Brown Family" and a great deal of other valuable information, this first volume embraces the Poultry Number, the Hog-Raising Number, the Dairy Farming Number, the Intensive Farming Number and the Special Oportunities Number, devoted to the exclusive treatment of the various subjects.

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CALIFORNIA SHIPBUILDING — G. W. DICKIE

THE BROWN FAMILY IN CALIFORNIA — JASON BROWN

BUILDING PERMITS AND REAL ESTATE SALES OF SAN FRANCISCO IN MARCH.

SOME SPECIFIC OPPORTUNITIES FOR MANUFACTORIES

ARE THERE OPPORTUNITIES FOR MANUFACTORIES IN CALIFORNIA? — THE EDITORS

THE CALIFORNIA PROMOTION COMMITTEE

SAN FRANCISCO

FOR CALIFORNIA.

APRIL, 1905.

Application Made at San Francisco Postoffice
For Entry as Second-Class Matter

THE CALIFORNIA PROMOTION COMMITTEE

(THE STATE CENTRAL ORGANIZATION)

THE PURPOSE OF THE COMMITTEE IS TO GIVE TO THE WORLD RELIABLE AND UNBIASED INFORMATION REGARDING THE RESOURCES OF AND THE OPPORTUNITIES IN CALIFORNIA. FOR CALIFORNIA IS PUBLISHED TO ASSIST IN CARRYING OUT THE OBJECTS IN VIEW.

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A MONTHLY PUBLICATION

"FOR THOSE WHO DESIRE THE BEST THERE IS IN LIFE."

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25 NEW MONTGOMERY STREET

SAN FRANCISCO

AN OLD MILL OF EARLY DAYS AND A WATER WHEEL OF MODERN TYPE.

THE WATER WHEEL IS USED TO DEVELOP ELECTRIC ENERGY FROM THE POWER OF MOUNTAIN STREAMS.
THE ABUNDANCE OF CHEAP POWER IS AN INDUCEMENT TO MANUFACTORIES IN CALIFORNIA.

(NOTE—IN REALITY THE MODERN WATER WHEEL ABOVE IS SOMEWHAT SMALLER THAN THE OLD MILL WHEEL IN THE ILLUSTRATION.)

A Chance for Manufactories in California.

I. B. McMAHILL.

CLIMATIC CONDITIONS.

THE climatic conditions of California are such that, according to the United States census of 1900, the workmen of California produce 32.9 per cent more in value of product, and with less fatigue, than do the workers in the Eastern States. This is accomplished in the face of the fact that concerns here are at least twenty-five years behind in equipment as compared with like concerns of the East, and are producing work on a retail basis as against wholesale production East. It is certainly more pleasant for a workman, and more conducive to good workmanship on his part, to be able to live in his own vine-covered cottage, as he can in California, instead of being herded in some tenement district of a great city. This is possible in California. It is also possible for him to accomplish more in a factory where there is an abundance of light and where the cold of winter does not have to be shut out by a great deal of walls and but few windows.

COST OF FUEL.

"The lack of a good and cheap coal" has been one of the chief arguments against the development of manufacturing in California. This is now entirely overcome by the discovery of oil, which, at 70 cents a barrel, is equal to coal at $2.25 per ton. The cost of handling coal as against oil has been demonstrated most successfully at the Salinas Sugar Factory, where a few men control the furnaces burning oil, which burning coal would require the attention of many more employees. Given coal at $3.60 per ton and oil at 70 cents per barrel, the oil is cheaper as a power-producing fuel by 37 1-2 per cent.

When it is taken into consideration that a manufacturing plant using any quantity of oil can contract for the same at less than 70 cents per barrel, it will be seen that the question of fuel in California is considerably in our favor, for the best Cumberland bituminous coal costs the Eastern manufacturer $3.60 per ton.

COST OF ELECTRIC POWER.

Electric power is being produced in California more cheaply than in the East.

RAW MATERIAL.

New England has long been given the palm for manufacturing, but few know that while doing this she has imported from abroad and from other sections of the United States fully 75 per cent of her raw materials used in manufacturing and 85 per cent of her foodstuffs. California, on the other hand, is importing to-day in foodstuffs but little more in value than the annual income of the Santa Clara Valley, which is only twenty by sixty miles in extent.

This State has within her borders two of the greatest deposits of hemitite iron known to exist in the United States, her underlying stratas of oil show inexhaustible volume, her forests produce some of the finest woods known to manufacturing, her mines are productive to an extent and variety unprecedented, and what she has not must yet be discovered elsewhere in the known world.

A CHANCE FOR MANUFACTORIES.

MANUFACTURING SITES.

With land miles in extent, where grading, piling and blasting is unnecessary, such lands being procurable at from one hundred to one thousand dollars per acre, the question of sites for manufacturing is certainly not one hard to answer in California. The larger as well as smaller manufacturing concerns of the East are as far as possible avoiding the greater cities and are placing their plants, even though removal be necessary, in smaller towns where the elements of labor agitation do not exist and where their employees may become home owners. California has a thousand towns where all of the above requirements can be found, and in the further presentation of this subject I hope to show reasons why, over and above the many shown hereinbefore, the Eastern manufacturer can well consider this State as a promising location.

TRANSPORTATION, HOME AND FOREIGN MARKETS.

With the longest coast line of any State in the Union, with the waves of the greatest ocean known to earth lapping her shores, with the shipping of the world lying at anchor in her harbors, with several of the greatest transcontinental railway lines tapping her every portion, California has certainly all the inducements, from a transportation standpoint, which any State could hope to present.

When the possibilities of manufacturing, as cited above in climatic conditions, cost of fuel, raw material and manufacturing sites, are given due weight, and when thought is given to the transportation facilities here afforded, it will be seen that it will pay to ship into California from the Far East of the United States the raw material, put it into a finished product and re-ship it to an Eastern market, and that this can be done in times of depression in commercial circles, and the product sold at a profit, and for less than the Eastern manufacturer can sell it at. These are great points, and once carefully noted they will result in making Cailfornia the leading manufacturing section of the Union, hence of the world.

As to home markets, the constantly increasing population of this State, which is destined to be the most densely populated in the Union, and which could support the population of France—38,000,000—the problem of home markets is one easily solved. California is importing shoes, belting, mining machinery, manufacturing machinery and tools of all kinds, agricultural implements, wooden ware, crockery and glassware, furniture, woolen goods and many other things, and if the demand did not exist here for these products they would not be sent here.

As to foreign markets, the greatest consumers of American-made goods are in the islands of the Pacific and the Orient. Statistics show that the development of trade for American manufactures, within a given period, was 250 per cent in Siam against 15 per cent in Germany. The old European countries lie nearest to the Atlantic seaboard and have, in a great majority of cases, their own manufactories, which are in keen competition with those of our country, while, on the other hand, the countries lying off the Pacific seaboard have few manufactories and comparatively none which can in anyway compete with those of the United States. All of these markets are most easily reached from California and it is obvious therefore that the manufacturing possibilities of this State must sooner or later be recognized. It is important, however that each community in California awake to the value of manufacturing and offer inducements to manufacturers similar to those offered by Eastern places which have long ago learned the lesson taught by the prosperity of every town and village which has welcomed with open arms the establishment of a factory. Imperial as is California in her mining, agricultural and horticultural development, she has but to add to these industries manufacturing to become invincible. The four industries enumerated form a combination which in times of financial depression can withstand against the most overwhelming odds, and the one supporting the other and the other the one, makes possible a condition of society not admissible under any other circumstances.

California Shipbuilding.

G. W. DICKIE.

CALIFORNIA, in the Bay of San Francisco, possesses the finest harbor on the western side of the American Continent, central in its position, and central also in the facilities of distribution.

In a harbor like this, frequented by steamships from all ports of the world, the shipbuilder and engineer is a necessity. The shipbuilding industry has existed in San Francisco, more or less active, for nearly fifty years, but iron and steel shipbuilding, combined with engineering, as an establishment on our own water front was not an accomplished fact until the Union Iron Works Company built their present establishment on the south side of Central Basin at Potrero in 1883.

The steamship and sailing ship repairs executed in this port constitute quite an industrial item, amounting approximately to over one million dollars per annum, about seven hundred thousand of which is paid in wages, and in order to meet sudden demands for large forces of men to execute quickly important repairs, shipbuilding must be carried on to a certain extent to form a base of supply.

The fact that the United States Navy Department had entrusted the building of twenty of the vessels of the New Navy to the Union Iron Works at an aggregate cost of about thirty-one million dollars has given this industry somewhat more than a local reputation.

An important fact in connection with the shipbuilding industry is the large proportion of the total value of the product that is paid in wages. This is why shipbuilding communities are generally prosperous, although the shipbuilder himself may not get rich at the business. The actual wages paid to the men on the twenty Government vessels built by the Union Iron Works will be about fourteen and one-half million dollars, and the same proportion will be nearly correct on all other shipbuilding and engineering work, and the earnings per man are also high in this industry. Some time ago, I computed the average earnings per man, including apprentice boys, the average being for a period of eighteen years, and found it to be eight hundred and seventeen dollars.

This is an industry worth preserving. More than that, it is worth cultivating, but it cannot be fed continuously on warships. San Francisco is to be one of the great commercial cities of the world and must own fleets of merchant ships and must build them to suit her special needs. Then let our people see to it that no obstacle stands in the way of our being a great ship-owning and shipbuilding center. The State can do much to foster this industry. The San Francisco shipowner, if he is ever so much in favor of patronizing home industry, has to meet, first, a higher first cost, which, instead of being offset by some remittance of tax burdens on the home-built and owned vessel, the fact of being built and owned here is made the occasion of imposing local tax burdens that foreign ships and ships owned in other States are free from, thus directly throttling our industries and suppression by law of all sentiment in favor of home industry.

I have repeatedly pointed out the absurdity of taxing ship property when the nature and use of the property taxed render it impossible for any part of the taxes thus levied to be expended for the benefit or protection of the property thus taxed. New York stands to the eastern coast of this country as San Francisco stands to the west coast. In New York, by act of the Legislature in 1881, all registered vessels and all earnings of registered vessel property were exempted from all taxes for State and local purposes for fifteen years, and on May 17, 1892, this exemption was extended for a period of thirty years. Can we blame a San Francisco ship-owner for going to New York to buy a ship, have her registered there and then bring her out for business on this coast, where she runs free of taxes because her owner was wise enough not to patronize home industry? I would also

enact a law that, to all vessels built and owned in this State, all ports and harbors under control of the State shall be free. This would give the home shipowner and shipbuilder a chance to help themselves and the State. With an extension of our industries, new values are created in every direction. The fostering of any productive industry by wise and helpful legislation must inevitably lead to the production of taxable property and thus increase the public revenue. A great future is expected for the commerce of San Francisco, the port of California. Shipbuilding and shipowning will be necessary factors to the realization of this future commercial prosperity. About twenty-five thousand of our population are now dependent on the shipbuilding industry of San Francisco. With all restrictions removed and the right kind of fostering care applied, there is no reason why there should not be one hundred thousand of our population, within the next ten years, directly supported by the shipbuilding industry of this port.

* * * * *

THE BROWN FAMILY IN CALIFORNIA

By JASON BROWN

CHAPTER THIRTEEN

THE LANTERN SLIDE LECTURE AT KINNEY'S CORNERS.

"SPOSE you've heard there's going to be a lantern slide lecture in Kinney's Corners Wednesday evening," said our good neighbor, Simpson, as he stopped his team at the gate and Ethel sprang, rosy and blushing, to the ground.

"Yes, indeed, I have," said I, "and we're all going."

"Good enough. These illustrated lectures on California are the very thing. It's all right to go prospecting off to Asia Minor for an evening or spending an hour or two looking at views of foreign lands, but when it comes to seeing something too many people don't know much about, just let me look at some California views. They're the finest in the land, and, by the way, I was just telling Miss Ethel that I think she'd make the prettiest picture in California."

So it happened that on Wednesday evening eight of us crowded into William Simpson's big three-seated rig. There was Mr. and Mrs. Simpson, myself and Mrs. Brown, and Ethel and Robert and Walter and Willie, still our baby at four years old. I don't know how much city people enjoy their amusements, but I can hardly think they can get such genuine and wholesome pleasure from them as we do from our simple recreations in the country. When we get through with our fun we feel good, and when they get through they have to work to get over it.

It was early summer in our California home, though the month was but March. The grass along the roadside was almost to a man's knees, and in some places they had been cutting it. Some of the grain was headed out and nodding in the moonlit fields. The breeze was warm and fragrant with the breath of the growing things. As we rolled along toward Kinney's Corners my wife and Mrs. Simpson struck up "Beulah Land." Will Simpson and I joined in, while Ethel's clear tones rang like her mother's when, years ago, a great country lad, my steps had followed her's to the little New England meeting house.

The hall was packed. Everybody was anxious to hear Mr. Erwin, who, as Special Commissioner of the State Publicity Committee of the California Promotion Committee, has shown his wonderful views and talked about California to people in the East. Before beginning the lecture Mr. Erwin told us how eager people were to see these pictures in the East and that he would shortly start on an extended journey through the United States and would show many new pictures which he was now gathering throughout California.

Then, in two brief hours, with the aid of the stereopticon, we journeyed all through California. We saw the Golden Gate crimsoned by the setting sun; the wonders of Yosemite, where great cataracts tumble thousands of feet into one of the most fertile and lovely valleys of earth; the dazzling whiteness of Mount Shasta, with its inexhaustible stores of water; the New Year's Flower Festival at Pasadena; the great combined steam harvesters that wind ponderously over the vast fields of waving grain, not only cutting, but threshing, and leaving the grain sacked in piles to be gathered up by the wagons following. Then we saw the lovely orchards all in blossom, and suddenly a bit of old New England flashed upon the screen.

"Whoop! look at those pumpkins!" cried Robert, startling the assemblage.

There they were—regular old New England pumpkins, a great field of them, and one appearing in the foreground was as high as the shoulders of a little girl standing beside it who, I should say, was about eight years old.

"Raw material for the kind of pie mother used to make," said Mr. Erwin.

Then we saw acres of peaches, prunes and apricots drying in the sun; a vineyard where raisins were being cut, and a merry party who were harvesting fruit and making a sort of outing party of their work by camping out.

"My, Jason, just think of it," said my wife, "we hear so much of California that we don't believe half of it, and yet when we do see it we know that it's so wonderful we wouldn't believe a well-informed man at all if he was bold enough to tell the truth."

"That's just it, Mrs. Brown. I've often thought the same thing, but it never came to me so forcibly as now, when we are seeing so many different features of California all at once."

At last the lecture was over and we all thanked the kindly man who had given us such a pleasant evening.

The next evening we were all seated out on the veranda talking over the lecture. You know in the country we get a double pleasure from our amusements by talking them over.

"What is the reason, Mr. Simpson," asked my wife, "that California, with its varied resources, imports so many manufactured products from the East?"

"That very point occurred to me, Mrs. Brown, when I looked at those wonderful lantern slides last night," said Simpson, "and it has occurred to me hundreds of times before when I have shipped material away back East to be manufactured into goods that I know can be made just as well out here. There are tremendous opportunities for manufacturing out in California, and we farmers have got just as good a chance to take advantage of the factors which make manufacturing possible as have any other class of people."

"What, in your mind, are some of the greatest inducements to manufacturing in California," I asked, "and how can the California farmer take advantage of its essentials?"

"Well," said Simpson, "you know this is beginning to be an age of machines. The farmer is getting to realize more and more that farming is most successfully done and best results are obtained when, as far as possible, the labor of man is supplanted by the labor of machinery, intelligently directed. As people have advanced in farming they have done away as far as possible with physical drudgery. In very early days manpower on the farm was succeeded by horsepower, although some manpower is still used, and in some countries women haul the plow. Now horsepower is being succeeded by machine power, and some day pretty nearly all the work of the farm, especially the drudgery, will be done by machines. Here in California we have an abundance of cheap power. There is petroleum and electricity. While an abundant supply of power induces to manufacturing, it also conduces to agriculture."

THE BROWN FAMILY IN CALIFORNIA.

"Have you heard, Mr. Simpson, how the farmers of Kane County, Illinois, are using electricity on the farms?" asked Ethel.

"Yes, indeed, I have," said Simpson, "and it is one of the finest things in the world. Fifty years ago the farmers of Kane County were opposed to the first railroad that went through Illinois; now they stand on record as the most advanced farmers in the world. They are taking up the use of electricity on the farm and almost all the work of the farm is performed by electric power.

"The electric motors which have been installed in Illinois are for sawing wood, pumping water, separating cream from milk, threshing corn, cutting fodder, plowing the fields, grinding apples, pulping potatoes, loading and unloading wagons at the barn, and a dozen other operations once performed by the farmhands and the patient horse.

"Here," said Simpson, taking a newspaper clipping from his pocket, "is the data on the use of electricity on an Illinois farm":

Cost of installation of an electric motor	$500.00	
Cost of power furnished per year, about	30.00	
Cost of repairs, etc., one year	10.00	
Total cost of electricity one year	$540.00	

Comparison with former methods:

Cost one farmhand wages one year at $25	$300.00	
Cost board and lodging one year at 50 cents per day	185.00	
Cost team of horses at $125 each	250.00	
Cost feed for same, five acres of land production for one year, valued at	200.00	
Cost shoeing, veterinary, repairs to harness, etc., one year	25.00	
Total cost one man and two horses one year	$960.00	
Saving with electricity over man and horse first year		$420.00

"The second year, of course, the gain is greater, for the electric plant does not have to be reinstalled, and $40 should cover the cost of power and repairs for the second year. The result on this farm shows that one fifteen horsepower motor takes the place and performed the work of one hired man and two draft horses.

"Here in California," continued Simpson, "there is an abundance of cheap petroleum and an enormous amount of electric power is developed from mountain streams. Every farm in California should have its electric line and its motor. Any intelligent ten-year-old boy can run an electric motor."

The May and June "Brown Family in California" will tell how the new vegetable cellar was built from some rock on Mr. Simpson's place.

* * * * *

BUILDING PERMITS AND REAL ESTATE SALES OF SAN FRANCISCO IN MARCH.

Building permits to the amount of $2,086,919 were taken out in San Francisco during the month of March. This sum exceeds the February permits. In that month San Francisco stood fifth in the magnitude of its building operations in the list of the principal cities of the country. Real estate sales in March amounted to $4,950,673, mortgages to $2,128,115, releases to $1,846,581. Bank clearings for the last week in April were $29,963,843, being 16.7 per cent greater than the corresponding week in 1904.

OPPORTUNITIES FOR MANUFACTORIES

AS PRESENTED BY A NUMBER OF COMMUNITIES.

THROUGH the following the reader will be enabled to get a definite idea of the character of some of the opportunities for manufactories in California. Space will not permit all such opportunities to be set forth in a single issue of FOR CALIFORNIA. Many other localities are set forth in the Opportunities Number of FOR CALIFORNIA, those here given not generally being included in that number.

UKIAH, MENDOCINO COUNTY.

Relative to inquiry concerning possibilities for manufacturing, first there are several inexhaustible beds of fine clay, constituting the very best material for pottery works and all of the modern building bricks and terra cotta articles.

Second. Factories for tan bark extract, the strength of the tan bark put into fluid shape and shipped in casks or barrels, anywhere along the coast of the county and in the timber belt, the home of the tan oak tree.

Third. Tanneries, as the tan bark is close by; or shipbuilding along the coast at the points where the large mills are situated.

Fourth. Box and chair factories near the mills, and where railroads are adjacent to the timber.

This valley and Potter Valley, eighteen miles north, should be a favored place for all manufacturing required to be done with complex machinery and needing continuous power, such as shoes, silks and the like, since a power plant is being installed by the Eel River Power and Irrigation Company, which contemplates taking the water from Eel River by tunneling through the mountain about a mile, drawing the water from the river and letting it fall about four hundred feet into Potter Valley, giving an unlimited electric power for light and power purposes and irrigation. Work is well under way.

J. C. RUDDOCK,
President Board of Trade.

OAKLAND.

Your letter addressed to the Merchants' Exchange of Oakland regarding manufacturing in California was considered at the meeting of the Directors last evening, and the Secretary was instructed to reply thereto, which I do with pleasure.

The organization of which I have the honor to be Secretary considers that the City of Oakland and immediate vicinities offer some of the best locations for manufacturing purposes in the State of California. At the present time there is a large area of unoccupied land fronting directly on Oakland Harbor which can be obtained at very reasonable prices considering its nearness to San Francisco, the Metropolis of the Pacific Coast.

As you are well aware, Oakland Harbor is being improved by the United States Government and the most available sites for manufacturing are being rapidly secured by factories of different kinds.

An association of Eastern capitalists at the present time is engaged in the construction of a large plant for manufacturing purposes. The California Cotton Mills, the California Flax Mills, the Pacific Steel and Wire Company and the many other manufacturing enterprises are now in successful operation, and it is only a question of a short time when the best of the manufacturing sites on Oakland Harbor will have been secured for factories.

The population of Oakland, Alameda and Berkeley is constantly increasing. We feel that the City of Oakland at the present time is the City of Opportunity in all lines of manufacturing.

OPPORTUNITIES FOR MANUFACTORIES.

The Merchants' Exchange of Oakland will be pleased to furnish more detailed information as to location and prices to all those intending to establish factories in the vicinity of our city.

WILBUR WALKER,
Secretary of the Merchants' Exchange.

PETALUMA.

You may well say to the world, "Keep your eyes on Petaluma for a manufacturing center"—thirty-seven miles north of San Francisco at the head of tidewater navigation, as well as steam and electric railway facilities, which will always insure cheap transportation to San Francisco and the markets of the world.

Our city believes in acquiring and setting aside for factory purposes suitable land and locations for new manufacturing establishments, whereby any worthy concern can come to Petaluma and get a suitable site free and in many cases a building erected for their use, suitable for their needs, and in many ways the city has made and is now ready and willing to encourage new industries to locate here. An honest investigation of the merits of Petaluma for a manufacturing and shipping location almost invariably results in a location at Petaluma.

Freight is shipped between Petaluma and San Francisco in quantities at from 60 cents to $1 per ton, and small packages, such as cases of thirty-six dozen eggs, are shipped from Petaluma to San Francisco at 10 cents per case and the empty case returned free—in fact, much cheaper than to take a package from Front street in San Francisco and deliver it to any other address in San Francisco.

We already have a nice list and line of factories in successful operation and employing many hundreds of hands. Among them are a silk mill, shoe factory, feed and flour mills, three incubator factories, saddle tree factories, three tanneries, planing mills, creameries, ice and cold storage plant, foundry and machine shops and four cigar factories, nearly all of which have grown up from a small beginning at Petaluma to their present strong financial standing and capacity, which prove that the conditions here are favorable to a profitable and increasing business.

Electric power in abundance can be had cheap—10 cents per 1000 watts—as well as an abundant supply of pure water.

Cheap homes can be purchased on very easy terms. Living is much cheaper and rents lower than in the larger cities. The educational, fraternal and social conditions at Petaluma are all that can be desired and such as to insure a contented, happy and prosperous home life. Our high school is on the accredited list with the Universities. Our intermediate school grades and facilities are equal to any in the State. A new Carnegie Library is about ready to install our 10,000 volumes of selected books. A new $40,000 theater insures a fine place of amusement to theater-loving people. Eleven churches; fine paved streets and cement sidewalks and cheap homes, in a progressive, rapidly growing community with prosperous business conditions; five banks in successful operation, with total assets of over $3,000,000 and only about 5000 population within the city limits of one and one-half miles square, speaks well for the financial and contented condition of Petaluma and her citizens. Outside the city limits, on five and ten acre tracts, within a radius of eight miles of Petaluma, are another 5000 population making their money and living on poultry, fruits and products of the soil, all contented and prosperous and assured a ready cash market daily for all their produce. Farther back from the city are the larger ranches of dairies, sheep and cattle, olives, vineyards and hops, redwoods and tan bark. Potatoes, wheat, corn, oats, barley, hay, sugar beets, apples, prunes and all known varieties of fruits, nuts and berries are raised here to perfection. One of the most productive and prosperous counties in the State, which abounds in raw material, products of her soil and gifts of nature,

which combines with the favorable position of Petaluma and furnishes an ideal and profitable location for building up and perpetuating various and numerous manufacturing establishments, that plants or parties seeking a new location need only to examine Petaluma's position and claim, and a location and profitable career is almost invariably the result.

J. W. HORN,
Secretary Petaluma Board of Trade.

PACIFIC GROVE.

Regarding manufacturing, there is plenty of sand suitable for glass-making in this city and plenty of cheap fuel in the shape of crude petroleum. Manufacturing sites near the Grove can be secured at very reasonable figures. Both rail and water transportation here.

WALLACE CLARENCE BROWN,
Secretary Pacific Grove Board of Trade.

WILLITS, MENDOCINO COUNTY.

There seems to be a good field here for the establishment of a door and sash factory, coffin boxes and lead pencil material. The redwood companies here can supply necessary material. It would be necessary to erect a dry kiln. There are some hard woods about from which furniture might be manufactured.

CHARLES F. CRAIG.
Secretary Willits Chamber of Commerce.

ANAHEIM.

There is a good opening in Anaheim to manufacture all kinds of fruit preserves, citric acid, etc. A plant for the extraction of oil from the castor beans would also do well, as those beans grow here in great abundance.

We have also large quantities of oil for fuel within a few miles of the Santa Fe and Southern Pacific Railways, both of which run through this place, and so cheap transportation could be secured.

E. MICHOD,
Secretary Anaheim Chamber of Commerce.

COLUSA.

The land around Colusa is well adapted to cultivation of sugar beets and the citizens of Colusa are ready to subscribe $100,000 toward the capital of a sugar beet factory. This is the most important thing in the manufacturing line that I know of for this locality.

J. L. SWANK,
Secretary Colusa Board of Trade.

ESCONDIDO.

I think that there is a good opening here for a cannery to handle vegetables, fruit, etc. There is an abundance of frostless land suitable for garden stuff and plenty of water for irrigating. The cheapest fuel would be crude oil, which is shipped in in tank cars.

LLOYD STEVENSON.
Secretary Escondido Chamber of Commerce.

OROVILLE.

The principal advantage which Oroville possesses as a site for factories is a close proximity to a great wealth of power. Electrical transmission has solved the problem of making the power of mountain streams available at distant points, but, as is well known, there is a loss in transmission which increases with distance, and the nearer the plant where power is used to the waterfall the more economical the operation. Oroville is the most advanced region in electrical power development. The immense plants of the Cali-

fornia Gas and Electric Corporation and its allied companies at Colgate, Centerville and de Sabla, which furnish power to bay cities, are near at hand to the east and north, respectively, and an uncompleted plant belonging to the same companies lies to the northeast on French Creek. Other companies have secured very valuable rights on Feather River and its branches in a northerly direction from Oroville, and opportunities for securing other locations are numerous, some of the most inviting spots being still unused.

To the advantage of cheap power should be added the advantage of the situation of Oroville, in a country rich in raw material and productive possibilities. We have within easy reach a wide variety of minerals, including clays, lime, paint, asbestos, gold, silver, copper, iron and other metals. We have a vast area of forests, quarries of marble and building stone, deposits of finest cement and the best of lime.

Oroville is located at the mouth of Feather River Canyon, the point where the proposed Western Pacific Railway will enter the Sacramento Valley, and probable point of divergence of various branch roads. Franchises entitling two electric roads to enter Oroville from valley points have been recently sold to parties who recognize the immense possibilities presented by the opening of the rich mountainous country by the Western Pacific Railroad. Facilities for transportation to various points will be of advantage to factories and will add to the other attractive features in inducing manufacturers to locate their plants here. The thousands of sheep raised near at hand make it a fine location for a woolen mill. A flour mill is just now something which Oroville is in much need of. An orange marmalade factory would have a good opening here.

Oroville presents attractions to the manufacturer which should soon bring him this way.

L. V. HENDRICKS,
Oroville, California.

NILES.

An excellent location for a fruit and vegetable cannery, in the center of one of the most productive regions in the State. All kinds of vegetables are grown and in apricots and cherries the quality is recognized as being equal to the very best in the State. Good shipping point, as it is a junction of the Southern Pacific Railroad, and it is expected that the Western Pacific will go through the town in the near future.

A good point for foundry or iron works that would bring its own skilled labor. There is no such enterprise here now.

A good point for a small bank which could carry the accounts of local business men and farmers and do a good deal of loaning on real estate.

Good place for large tourist or summer hotel.

J. C. SHINN,
Niles, Alameda County, California.

OLINDA.

Yours requesting information in regard to manufactories received, and I suggest a box or sash and door manufactory. There is an abundant supply of fine sugar pine to be had and an abundant supply of electricity to operate it. There is some fine water power yet undeveloped.

L. D. WALKER,
Secretary Olinda Improvement Club.

AUBURN.

Auburn offers a free site and cheap power for any manufactory and has good railway facilities for transportation for the raw and manufactured article.

We have in raw material a deposit for making building material or building blocks which has been tested so that it is considered fire proof. We have abundance of different kind of wood that might be worked up into different articles of furniture, etc.

OPPORTUNITIES FOR MANUFACTORIES.

We believe that many other articles could be manufactured here where the raw material could be brought in.

Our power would be both electric and water. We have three large electric plants in this county and have numerous natural water power facilities.

J. H. WILLS,
Secretary Placer County Improvement Association.

CONTRA COSTA COUNTY.

Victor H. Metcalf, Secretary of Commerce and Labor, said in a recent speech that Government statistics showed that Contra Costa County stood second of all the counties in California in the value of its manufactured products. San Francisco, with its 400,000 inhabitants, heads the list, and then comes little Contra Costa County with its manufactures, turning out last year $36,000,000 worth of goods to be distributed to the world by our incomparable transportation facilities.

The works now in construction and in process of construction should double this in the next five years.

What has caused this influx of money and enterprise in so few years, and without any unusual advertising or booming of this county?

One reason is that we have seventy miles of deep water frontage and every mile of it is good safe harbor in any and all kinds of weather, a natural advantage that cannot be duplicated in California. Vessels from Japan, China, Australia and the islands sail to our very doors. The building of the Panama Canal will bring us 9000 miles nearer the markets of the Atlantic seaboard. When all these markets are fully opened up it will make Contra Costa County one of the richest and greatest manufacturing centers of the country. To make this location still more desirable, two overland railroads—the Southern Pacific and the Santa Fe—have built their roads along the shore line nearly side by side. These roads put us in quick and cheap communication with all parts of the West and the East, while our ocean transportation connects us with the rest of the world. Any ship that can pass the Golden Gate can sail to the wharves of Contra Costa County.

So the raw material and the finished product are loaded either on ocean-going vessels or the railroads at the factory doors, and the cost of transportation is reduced to the lowest figure.

We have a pipe line from the Kern County oil fields to our water front, furnishing the cheapest fuel to be found in the country. Besides, we have electricity from a power line, brought from the mountains, furnishing power for lighting and mechanical purposes at cheap rates and in any amount required.

We did not have all these inducements to offer the enterprising men with money and ambition when they first commenced to build their wharves and warehouses and factories in this county, but we had one advantage that nature provided and that nature alone can duplicate, and that is our magnificent harbor frontage.

D. J. WEST,
Martinez, California.

Are There Opportunities For Manufactories in California.

THE EDITORS.

POWER, transportation and raw material—these are the three essentials to every manufacturing enterprise, and according as they are cheap or abundant so the opportunities for manufacturers are determined.

In California these essential conditions exist in a somewhat unusual degree. With a coast line of almost twelve hundred miles, facing the markets of the Orient, and affording transportation to the ports of the world, the possibilities of foreign trade seem almost unlimited. Taking in account the remarkable and varied resources of the State, its manufacturing life has scarcely begun. Its vast forests have only been commercially exploited to a very limited degree and it is said that in Humboldt County alone less than one-tenth of the total lumber acreage has been harvested in all the operations of the last fifty years. Throughout the Sierras are vast forests of pine and fir. Lumber is only one of the many raw materials which will be commercially exploited. There is an abundance of other material which can be utilized without appreciably destroying its quantity.

The problem of fuel and power has been remarkably solved in California by the discovery of vast fields of petroleum and by the generation of electric power from the energy of mountain streams. The force of mountain streams through electric transmission is now generally available where illumination and power are required.

Electric energy is divisible. The manufacturer can use as much or as little of it as he desires and only pays for what he uses. Owing to the increase in the electric power and the improved methods of long-distance transmission, the census taken at the present time would probably show a great increase in the number of small manufactories.

In some places in California electric power has been furnished as cheap as fifty dollars a year per horsepower in small quantities. It is purchased often, for pumping plants at the rate of one cent and three-quarters to a cent and a half per horse power per hour. A great amount of power is sold to the dredging companies around Oroville at about eight dollars per horsepower per month. With the development of electric energy the problem of the manufacturer is solved. The small manufacturer in the little shop can secure a horsepower to run his shop at a rate which is encouraging. Here's a theoretical horse which works twenty-four hours in the day three hundred and sixty-five days in the year and never eats, sleeps or requires care, and has actually more energy than a real horse. Any other State with less wealth than California would have been seriously impoverished through sending away so much money for goods which can be manufactured within its borders. Carloads of show cases are brought here every year. The glass used is brought from Belgium and the wood used, mostly oak, is brought in its finished state from Grand Rapids. In California there is an abundance of glass sand which has been pronounced by experts to compare favorably with the Belgium glass sand, and there is an abundance of wood material which could be used in making showcases. Much of the raw material of some of the articles used here is shipped to the East, manufactured and then returned to California, where it is used in its completed form. The statement was recently made by a large woolen dealer that he had to send all his wool to New York to be cleaned because there were not facilities enough for him to get his wool cleaned here. Yet California manufactures some of the finest woolens and blankets in the world. A well-known man in one of the smaller cities in this State sent to Chicago to secure several pairs of the best blankets in the market for his daughter, who was about to set up housekeeping. When the blankets came, he found upon them a mark showing that they had been manufactured in his own town and not three blocks away from where he lived.

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Brooklyn
California
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Hotel Rafael
Hotel St. Francis.
International Hotel
Lick House
Manhattan Hotel
New Western Hotel
Palace Hotel

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Fireman's Fund Insurance Co.
Foster, Geo. H. Co.
Forbes, Stanley (Mutual Life)
Hartford Fire Insurance Co.
National Fire Insurance Co.
Pacific Mutual Life Insurance of California
Royal and Queen Insurance Co.
The Liverpool, London and Globe Insurance Co.
Ward, C. H.

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Judis, Alphonse Co.
Radke & Co.
Schussler, M. & Co.
Schweitzer, Joseph
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Standard Portland Cement Co.

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Meese & Gottfried Co.
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Moore, Charles C.
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Neustadter Bros.
Prager, A. J. & Sons

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Pacific Meter Co.

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Pacific Metal Works
Selby Smelting Works

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Port Costa Milling Co.
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MILLINERY.
Topiitz, Robt. L. & Co.

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Spinks, Chas. H.

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Heineman, H. M.

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Heynemann & Co.

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Morgan Oyster Co.

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PAPER DEALERS.
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Bonestell, Richardson & Co.
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Pischel, Kaspar (oculist)
Rosenstirn, Julius

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Martin, Henry J.
Redington & Co.
Schmidt, Val

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Manzy, Byron
Sherman, Clay & Co.

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Gladding, McBean & Co.

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Allen's

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Commercial Publishing Co.
Gibson & Goldwater
Murdock, C. A. & Co.
Partridge, John
Phillips & Van Orden Co.

PUBLICATIONS.
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Guide, The

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California Northwestern Railroad

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Baldwin & Howell
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Bush, David & Sons
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Goldman, J. & Co.
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Lyon & Hoag
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Quinn, John E.
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Western Union Tel. Co.

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STRUCTURAL MINERALS NUMBER

FOR CALIFORNIA

FRONTISPIECE—NEW POST OFFICE BUILDING, SAN FRANCISCO.

CHARACTER OF CALIFORNIA STRUCTURAL MATERIALS
LEWIS E. AUBURY

BRICK MANUFACTURE IN CALIFORNIA

BUILDING MATERIALS OF CALIFORNIA
JOHN GALEN HOWARD

CALIFORNIA'S PRODUCTION OF STRUCTURAL MATERIALS

ONYX MARBLE

THE BROWN FAMILY IN CALIFORNIA JASON BROWN

A LITTLE KNOWN RESOURCE

METROPOLITAN ESSENTIALS THOMAS MCCALEB

SIXTY MILLIONS FOR TABLE CHINA?

THE CALIFORNIA PROMOTION COMMITTEE

SAN FRANCISCO

FOR CALIFORNIA.

MAY, 1905.

Application Made at San Francisco Postoffice
For Entry as Second-Class Matter

THE CALIFORNIA PROMOTION COMMITTEE

(THE STATE CENTRAL ORGANIZATION)

THE PURPOSE OF THE COMMITTEE IS TO GIVE TO THE WORLD RELIABLE AND UNBIASED INFORMATION REGARDING THE RESOURCES OF AND THE OPPORTUNITIES IN CALIFORNIA. FOR CALIFORNIA IS PUBLISHED TO ASSIST IN CARRYING OUT THE OBJECTS IN VIEW.

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THE HANDSOME NEW POST OFFICE NOW BUILDING AT SAN FRANCISCO, IN WHICH CALIFORNIA GRANITE IS USED.

THROUGHOUT THE WHOLE STATE OF CALIFORNIA ARE MANY SPLENDID BUILDINGS, IN WHICH HOME STRUCTURAL MINERALS ARE USED.

THE CHARACTER OF CALIFORNIA STRUCTURAL MATERIALS.

LEWIS B. AUBURY, State Mineralogist.

THE growth of development of the essential structural material resources in California has been strikingly emphasized by the field work of the State Mining Bureau assistants engaged in the securing and preparation of data on the Structural and Industrial Materials of California.

California can and should produce every cubic foot of sandstone, granite, marble and onyx, every barrel of cement, all the clay and terra cotta ware, paint and soda that may be employed or consumed within the State, and become an exporter of all these materials and wares. There is no necessity for importation of these from other States.

Within the two years, 1903-1904, California builders have imported from other States, approximately, 18,000 cubic feet of sandstone, 17,000 cubic feet of granite, 37,000 cubic feet of marble and onyx. That is just 72,000 cubic feet more than should have been imported. But when one considers that in those two years California produced, approximately, 800,000 cubic feet of sandstone, 850,000 of granite and 200,000 of marble, the import figures do not appear so terrifying.

These figures are approximated, but they are close enough for the purposes of comparison.

California cement is another material that within the past two or three years has shown what can be done in this State by the application of commercial energy to the natural resources. There are now in operation three cement plants in the State, and the demand for their products is enormous. Compared with the imports from other States, the California production cuts a very large figure. In the two years, 1903-1904, the imports from other States amounted approximately to about 23,000 barrels. California produced in that period about one and one-half million barrels.

California mineral paint is an essential material that should in the future receive greater encouragement from the manufacturers than it has in the past. The product of 1903 was greater than the imports of the two years of 1903-1904, and two of the available deposits in the State were not operated. There is not the slightest doubt of the quality of the production; that has been demonstrated. Activity of producers and encouragement by the dealers and manufacturers will reduce the imports very materially within the next two years.

The manufacture and employment of concrete is one of the essential structural industries that is making great strides in California. Since this State produces the cement and the basic materials in the form of trap rocks and gravel are so abundantly and economically distributed in the hills and streams, there is no longer a question of the economy of employment of concrete for foundations and walls of buildings, for culverts, and for structural work applied to irrigation and drainage.

Akin to this industry, and one that is advancing rapidly, is the manufacture of structural hollow ware for use in the interior construction of fireproof buildings. California provides also the base for this ware in the clays and cemented lavas that are abundant in many counties.

Note.—The field assistants of the State Mining Bureau have been making observations and investigations and reporting from occurrences of materials that may be employed in structural and industrial operations. The Mining Bureau will shortly issue a bulletin giving in full reports of the field assistants on structural and industrial materials in California and many other matters of importance.

CHARACTER OF STRUCTURAL MATERIALS—LEWIS E. AUBURY.

New deposits of efficient fireclays are being discovered, and magnesite as a component of refractory brick is being experimented. Magnesite bricks are the most refractory of all the essential bricks employed to withstand the great heat of an oil-burning furnace. The magnesite bricks employed in the furnaces of this State are imported from Pennsylvania and Germany; but experiments are in progress looking toward the successful manufacture of magnesite bricks in this State.

The availability of eruptive tufa for employment as building stone is being investigated by owners of quarries and other property containing this long-neglected material. The utility and economy of its use in various characters of buildings are being recognized.

Iron, though an undeveloped metal in California, is abundant and of excellent quality for industrial uses. The prospecting and developing await only the application of capital, and the successful manufacture of California iron will find a market within the Pacific Coast country. The iron in Placer County has been proven, while Nevada and Butte Counties contain prospects that are attracting attention. Madera and San Bernardino Counties also contain large deposits of desirable iron ore.

It may be of interest to recite the names of the counties producing some of these materials:

Granite—Fresno, Madera, Nevada, Placer, Riverside, Sacramento, San Diego, San Luis Obispo, Santa Cruz, Solano, Trinity, Tulare, Tuolumne.

Magnesite—Napa, Sonoma, Santa Clara, Tulare.

Marble—Amador, Inyo, Riverside, San Bernardino, Tuolumne.

Mineral Paint—Calaveras, Sonoma, Stanislaus.

Sandstone—Colusa, Contra Costa, Los Angeles, San Luis Obispo, Santa Barbara, Santa Clara, Ventura, Yolo. (Every county in the State.)

Concrete Gravel—Colusa, Glenn, Yolo.

Concrete Rock—Alameda, Los Angeles, Madera, Marin, Monterey, Placer, Riverside, Sacramento, San Benito, San Bernardino, San Francisco, Santa Cruz, Shasta, Solano, Sonoma, Ventura.

These counties are producers of the materials named. To add the names of counties in which these or others of the forty-six structural and industrial materials occur, undeveloped, would be to include all the counties of the State. The prosecution of the operations of the producers to their full capacity and the development of the latent resources would double the production of the State, which for the years named is approximately $20,000,000.

* * * * *

IMPORTS TO CALIFORNIA

(By rail for 2 years ending June 30, 1904)

Bricks, 142 carloads; clays, 2531 tons; cement, 4770 tons; granite, 210 tons; gypsum, 6629 tons; lime, 29 tons; marble and onyx, 3761 tons; macadam, 204 tons; paint, 2080 tons; building stone, 1511 tons; slate, 45 tons; soda, 6040 tons.

* * * * *

BRICK MANUFACTURE IN CALIFORNIA.

Since 1893 more than a million thousands of bricks have been made in California. Previous to that year the California-made bricks were employed chiefly by local contractors, their manufacture and use dating back to 1850. Commercially, the brick trade covers the period of eleven years here mentioned; the adoption of improved brick molding machines and the continuous down draft kilns enabling the larger producers to furnish this character of building material to the interior and coast towns for quick delivery at the same price that the local contractor could supply them.

BUILDING MATERIALS OF CALIFORNIA

JOHN GALEN HOWARD

SINGULARLY blessed as California is in the matter of climate and the beauty of its natural scenery, the State is hardly less fortunate in respect of the building materials with which it is endowed. Only a few of the more conspicuous products have been developed up to the present time. Vast opportunities are offered for future development by the inexhaustible deposits of building stone, lime, clay, sand and other minerals used in the building arts, as well as by the enormous tracts of forest wherein the timber attains astonishing proportions.

First in point of monumental quality of all the materials which enter into building operations may be mentioned granite. A large portion of the Sierra Nevada Mountains is underlain by or visibly made up of granite of excellent quality. Several quarries are already in active operation, notably those at Folsom and at Raymond. The former is of good structural quality, of a darkish grey color, somewhat coarse in texture. The Raymond granite is one of the best building stones to be found anywhere. For color, texture, grain and durability, it is hard to beat.

Among sandstones those from Colusa and San Jose are the most widely known. The San Jose stone is of a rich, warm yellow color, slightly coarse in grain. This stone has been used very largely at Stanford University. The Colusa sandstone is somewhat harder and of excellent quality structurally. In color, it is of a greenish grey. This stone is very largely used at the present time in San Francisco and thereabouts.

Several other quarries producing stone of various degrees of excellence have been recently opened, but their product has not as yet been given a sufficient trial to justify a conclusive testimony as to their character.

California is producing from several quarries in active operation a large quantity of marble of high character. Notable among these is the Columbia marble quarried in Tuolumne County. There are two shades—a dark and a light, both of neutral grey tone. The lighter is handsomely veined, hard and durable, well fitted for wainscoting, plumbing work, floors and mosaic. It is largely used at present in the local market and is rapidly extending its sphere of operations.

Inyo County contains valuable deposits of white marble useful for exterior ashlar. This stone was used on the ground story of the Mills Building, San Francisco. San Diego produces a marble of a rich pale green, brilliantly variegated and useful for interior decorative work. Onyx of the most varied character is to be had from several localities, especially in the southern portion of the State.

The manufacture of Portland cement has recently been taken up and has already assumed large proportions. The Standard and Golden Gate brands are now to be had at extremely reasonable prices. Both brands have shown excellent results under severe tests and there can be no question but that they have a great future and are destined to play an important part in the structural development of the State.

Brick-making is a long-established industry in this community. Inexhaustible supplies of clay of every desirable color are to be found in many parts of the State. Brick manufacturers are too numerous to mention individually. Suffice it to say that the quality of the output is in general first class, both in respect to common brick and the finer varieties of face brick.

The same might be said of terra cotta. The State possesses exceptional advantages for the manufacture of the highest grade of this material. The demand for decorative terra cottas for use not only in wall structure, but for roof tile, flower pots, decorative urns, sewer pipe, drains, etc., is constantly and rapidly growing.

Wall plasters of first quality are being manufactured in ever-increasing quantities. The limes of Roche Harbor and of Santa Cruz are of well-known high quality. Plaster cements such as Empire, Alpine, Wood Fibre, Marbleite, etc., are very largely used and give excellent satisfaction.

The fabrication of steel has not as yet assumed great proportions in California, largely owing doubtless to the difficulties in the way of securing the ore and proper fuel in the same locality. It is to be hoped that some means may be devised in the near future to obviate this difficulty. The coast needs the development of this branch of industry more perhaps than any other. The manufacture of ornamental iron has assumed considerable proportions and the output is of an excellent quality.

California can hardly be said to lack sand either as to moral quality or as to building material, nor does it lack rocks, of the highest grade for use in concrete and road building.

Various branches of manufacture deserve favorable mention, such as bitumen, asbestus, glass, nails, building paper, etc. There is an increasing demand for all of these materials and excellent opportunities are offered in supplying them.

Of woods, the Golden State possesses a great variety and an enormous supply. Redwood and Douglas fir are the greatest staples. Both these woods are universally used throughout the State and are shipped to other parts of the country and abroad in large quantities. The Douglas fir is of splendid quality for structural work as well as for interior finish, for which it is largely employed. The Redwood is famous for its beauty of color and of grain. It is very easily worked and is one of the most beautiful woods on the market for finishing. It is obtainable in very large pieces owing to the size of the trees from which it is cut. When wisely used it is of exceeding beauty.

Maple, oak, white cedar, laurel, white mahogany—these are a few, and but a few, of the great number of building woods obtainable in the State. Not all of them are widely used at present, but it is only a question of time when their value will be appreciated.

* * * * *

A Few of the Well Known Structures Built of California Material.

WHEN the character and the quality of the buildings completed or begun in the past two or three years, as illustrated by the following incomplete list, are considered, it may readily be understood why California building stone is growing in popularity so rapidly. The following buildings are of sandstone: James Flood Building, Kohl (formerly Hayward) Building, Shereth Israel Synagogue, St. Francis Hotel, Mutual Savings Bank, Crocker-Shreve, Miller, Sloss & Scott, Oakland Union Savings Bank, Redwood City Courthouse, and numerous smaller and less pretentious buildings, such as Brandenstein, Woods, Alexander, Schroth, Starr Estate, Iroquois Hotel.

The following buildings are granite: San Francisco Postoffice, Fairmount Hotel, Mercantile Trust, and Italian-American Bank.

This is not going far away from San Francisco, but as a complete list of the buildings in the State constructed of California stone is not at present available, these must suffice for the purpose of illustration. To these may be added the State Ferry Building in San Francisco, constructed of California sandstone, and the State Capitol Building at Sacramento, of granite. These two were erected many years ago.

And the handsome buildings of the Stanford University, too, are object lessons of the value of California stone.

Of course, there are many other fine buildings, but just a few which come to mind at this writing are mentioned. Obviously, it is impossible to mention all.

California's Production of Structural and Industrial Materials.

CALIFORNIA produces forty-seven mineral substances that broadly may be classified as structural, industrial and commercial materials. The strictly mineral or metallic substances produced are gold, silver, copper, quicksilver, making the total number of substances fifty-one. The aggregate values of all these fifty-one mineral substances for the seventeen years beginning with 1887 and ending with 1903, are $418,851,833.

Thirty-seven strictly structural and industrial materials produced by California in the last seventeen years aggregate in value $54,767,164.

These thirty-seven substances are: Antimony, asbestus, cement, chrome, chrysoprase, clay (brick), clay (pottery), fullersearth, granite, graphite, gypsum, infusorial earth, iron ore, lead, lime and limestone, lithia mica, macadam, magnesite, manganese, marble, mica, mineral paint, onyx, and travertine, paving blocks, platinum, pyrites, quartz crystals, rubble, sand (glass), sand (quartz), sandstone, serpentine, slate, soapstone, soda, sulphur.

In the year 1887 the substances produced numbered twenty-one, valued at $2,948,251. In 1903 thirty-nine substances were produced, valued at $16,913,381.

Those that did not fail of production during the seventeen years are: Asphalt, bituminous rock, borax, pottery clay, coal, gypsum, granite, lead, magnesite, manganese, marble, mineral water, petroleum, salt, sandstone.

Cement was not produced commercially in California until 1891. The product that year was 5000 barrels, valued at $15,000. With the exception of 1893 there has been an annual product since 1891, which in 1903 had increased to 640,868 barrels, valued at $968,727.

Pottery clays, including materials employed in the manufacture of terra cotta ware, while improving in value, have not shown an appreciable increase in quantity. In 1875 the output was 75,000 tons, which increased to 100,000 in 1890 and decreased to 24,592 tons in 1897. But with the decrease in the quantity recorded there was an increase in value from an average of 50 cents per ton to $1.00 per ton; and from that year a steady increase in quantity (and maintenance of value) to 90,972 tons in 1903.

The production of granite made the largest showing from 1889 to 1892, averaging more than one million dollars a year and totaling for the four years $4,829,018. In the past five years there has been an increase in granite production to $678,670 in 1903.

Magnesite production increased from 600 tons in 1887 to 4726 tons in 1901, but decreased to 2830 tons in 1902 and 1361 tons in 1903.

Marble increased in production in the seventeen years from $5000 to $97,354. The largest production was in 1892, when the values reached $115,000. From that year the production was variable until 1902, when there was an increase from 2945 cubic feet of the previous year to 19,305 cubic feet.

The production of soda was not begun until 1894. In 1903 only the production of crude soda was recorded, amounting to 18,000 tons. Prices for the refined soda in the ten years varied from $25 to $50 a ton. The total production for the ten years was 62,430 tons, valued at $1,173,500. Imports in 1903-1904 amounted to more than 6000 tons.

Asphalt and bituminous rock showed a total combined production of 884,746 tons, valued at $5,914,667. Asphalt gave the smallest returns, $16,000, in 1887, and the largest, $503,659, in 1903. The smallest output of bituminous rock was recorded for 1902, $43,411, and the largest in 1893, $192,036.

PRODUCTION OF STRUCTURAL MATERIALS.

The production of lime and limestone for the seventeen years totaled $6,262,478, beginning with $368,750 and concluding with $592,268.

The record of onyx and travertine reads in values, beginning with $900 in 1887 and ending with $24,000 in 1896. The biggest output in the ten years was $27,000 in 1893. The total production for the ten years was $91,400.

More than a million thousands of bricks are recorded for the eleven years beginning 1893. Only in the firebrick and pressed brick trade have the California makers been met with interstate or foreign competition. The brickmakers are, however, gradually reducing that competition, as available clays for firebricks and the finer quality of pressed bricks are being prospected and developed.

The continued increase in the production of petroleum is a part of the mineral history of the State. The record of rapid and steady increase dates from 1889, when the output was valued at only $368,048. The increase continued until in 1894 it reached $1,064,521, and $7,313,271 in 1903.

The forty-six mineral substances other than gold, silver, copper, quicksilver and petroleum, make the following aggregate annual showing for five years ended 1903, indicating an average annual increase of more than one and one-half million dollars: 1899, $3,392,664; 1900, $5,165,290; 1901, $6,378,723; 1902, $8,333,685; 1903, $9,590,110.

In 1899 four new industries were developed, adding $20,500 to the output of that year. These were fullersearth ($12,400), lithia mica ($4600), glass sand ($2000), quartz sand ($1500).

Chrome ($1400) and quartz crystals ($18,000) were added to the productions of 1900, but in that year no production of platinum was recorded—the only year in seventeen that this mineral failed.

Graphite and soapstone were the added new productions for the year 1901, the former valued at $4480, the latter only $119.

Antimony, asbestus, quartz crystals and quartz sand failed of recorded production in 1902, and only three new substances were added—chrysoprase ($500), infusorial earth ($2532), mica ($2500). Infusorial earth was not, strictly saying, a new product, but its production had been irregular, and only five tons were recorded between 1894 and 1902.

In 1903 no new products were recorded, but the production of quartz crystals was resumed to the value of $1968.

* * * * *

ONYX MARBLE A HANDSOME FINISHING MATERIAL

Onyx marble, or Aragonite (carbonate of calcium), is found in a great many parts of California. This material in its beauty compares favorably with the agate of Lake Superior. Some specimens of onyx marble when polished show a deep blood red like the heart of a rose, others present the appearance of a cloud bank, and there are still others that look like the clouds in the East when touched by rays of the setting sun. Some specimens of aragonite are of a chocolate color. In fact, the difference of the appearances of aragonite shows it to be a most versatile substance. Some exceptionally handsome specimens can be seen at the Museum of the State Mining Bureau, Ferry Building. Aragonite is chiefly used for surfacing for tables, etc.

THE BROWN FAMILY IN CALIFORNIA

By JASON BROWN

CHAPTER FOURTEEN

THE ODD DISCOVERY IN THE ROCKY FIELD

SOMETIMES it would happen that, busied on my California farm, several weeks would elapse in which I would not see my helpful and interesting friend, William Simpson, of the Estudillo Rancho. On such occasions, it was Simpson's almost invariable custom to "re-convene," as he said, the conversation where it had last been left off.

Now, before our hearthfire or upon the veranda of a mellow evening, our conversations are not between two dialoguers, but everybody joins in. Our children take as active an interest in matters discussed for our betterment as do we ourselves. In fact, this is one of the reasons that you will find country children as a rule on a closer relationship with their parents than the city child. We in the country make companions of our children.

But back to this particular evening and this particular conversation.

"Jason, you're getting a reputation as an extraordinary farmer," said Simpson, "and as I was saying, the root house you have built on the hill shows you to be somewhat of an artisan."

"That's the word," cried my wife, giving me a sly dig. "Jason's an artisan, but not an architect."

"Well, papa deserves a reputation," chimed in Robert. "Just think how he's been writing up his coming to California. Why, a man up near Red Bluff wrote papa that there wasn't any Jason Brown. He knew all the Brown family, he said, and there was none of them by that name."

"But did you hear about the fellow down near San Jacinto?" asked Walter. "His name is Jason Brown, too. He wrote papa that the stories he's been writing about his experiences in California were a malicious outrage. 'I've never been in New England,' he said, 'and you've no business to use my name.' "

"Well, well," said Simpson, "the world is sure full of lobsters. If your story has helped any one to realize the opportunities in diversified farming it has surely been worth while."

"Yes," said Ethel, "they'll get papa so tangled up he won't know which Jason Brown he is, and then of course he'll be just like the hero of one of Henry James' novels."

You know, Ethel prides herself on reading Henry James. With circulating libraries, the young country girls of to-day read more substantial literature than the average city girl.

"Well," said Simpson, "we've wandered a long way from the subject, but the root house which Jason built on the hillside is still there, and I move we all go up and have a look at it."

So we all went up to my new vegetable cellar on the hillside just beyond the two acres in potatoes. It was a stolid little structure about 8 feet high at the gable, 14 feet wide and 20 feet long, but it backed into the hillside, so that all its length was not visible. I had built it along the lines of an old New England spring house, and a little spring gushed from the very back of my root house, and running beneath the wooden floor of the house, it kept it cool the year round.

"Pretty neat affair, Jason," said Simpson, glancing with admiration at the root house, "but where did you get all that rock?"

"Why, that came from the rocky field near to your back pasture," I answered.

"Why, that's odd," said Simpson. "I never noticed any granite there."

"Granite?" said Mrs. Simpson, with a rising inflection.

BROWN FAMILY—A LITTLE KNOWN RESOURCE.

"Yes, I believe this little vegetable house of Jason's is built of an unusually fine quality of granite," said Simpson. "I shouldn't be surprised if there was a vast ledge of solid building granite underlying that rocky field. You will notice we have always found water this side of the rocky ledge, and I believe the water crowds up against the granite."

"Well," said I, "I think I'll keep right on farming."

"Certainly," said Mrs. Brown, "but you might sell the granite to some structural company."

"Dear me, how many things there are in California; it fairly makes one's head swim," said my wife. "Let's go back and have dinner. I'm sure the chickens and green corn are ready."

And so we did.

* * * * *

INTERESTING PRODUCTION OF VALUABLE MATERIALS.

In the seventeen years ending 1903, the production in California of gold was $247,371,953, silver $13,665,322, quicksilver $20,530,727, copper $25,549,309, asphalt $3,773,967, bituminous rocks $2,140,690, borax $13,355,504, coal $4,583,353, mineral waters $5,006,158, natural gas $1,045,082, petroleum $34,381,268, salt $2,642,817, tourmaline $270,500, turquoise $61,600.

* * * * *

STRUCTURAL MATERIALS—A LITTLE KNOWN RESOURCE.

ABOUT fifty years ago a man who had made a fortune in the placer streams of California concluded that he would be content to retire and stay in this State the rest of his life if only he could have a good, old-fashioned New England brick house to live in. He chartered a sailing vessel in New England, loaded it with bricks, and had the vessel brought 'round the Horn, through the Golden Gate, up the Sacramento River, and further up the Feather River to Marysville. Here he built a house like the one he was born in.

The story is a pointed one because for years people have sent to the East for articles of infinite variety that can be had in California in great abundance.

Had the mining man known it, he could have secured the bricks he wanted right in California, and at a great deal less cost. During the last eleven years more than a million thousands of bricks have been made in California. The retired miner could have built a palace and have secured all his material in this State.

There is a wonderful variety of mineral building materials in California. In fact, this State contains within her own boundaries all elements necessary to the most advanced civilization. The vast resources of structural materials extend capital opportunities in their development.

It is hoped that every reader of FOR CALIFORNIA will assist in spreading abroad the interesting data contained in this issue. You have, perhaps, had no idea of the great variety of these building materials and the abundance, practically inexhaustible, in which many of these materials are found.

There is a fascinating interest in this story of the resources which a prodigal nature has placed at the disposal of man.

Many of the materials are exceedingly beautiful; all possess commercial value.

METROPOLITAN ESSENTIALS

THOS. McCALEB
Secretary of the Association for the Improvement and Adornment of San Francisco.

The Association for the Adornment and Improvement of San Francisco contemplates raising the standard as set by man in the making of San Francisco to the imperial standard which has been set by nature for the Pacific Coast Metropolis.

San Francisco will then be the Rome of the English-speaking world, not only as she now is in her regal position, but through the planning and building by the hands of men.

Other California cities will be treated subsequently.

* * * * *

THE Association for the Improvement and Adornment of San Francisco, which was formed a little over a year ago, promises much towards making San Francisco not only a more desirable place of residence, but a great tourist resort.

Among the objects of the Association are to bring to the attention of our people the best methods for instituting artistic municipal betterments, and to suggest and promote quasi-public and philanthropic enterprises.

As a first necessary step we engaged Mr. D. H. Burnham, the eminent architect, to prepare a comprehensive and practical plan for the improvement and adornment of the city. He and his draftsmen are at work on this plan at the Association's studio at Twin Peaks, and it will now be ready within five months. The plan will be used as a guide for all our future municipal improvements of a more or less artistic character, as well as for the elevation of the public taste. In it will be incorporated various suggestions, such as the laying out of new streets, new parks and park extension, new grades, and new roads in, around and out of the city, that will make the hills and suburbs convenient of access. The necessity for the construction of a boulevard around the bay shore, the extension of Market street to the ocean, a suitable approach to Golden Gate Park, the creation of a "Civic Center," the treatment of the Laguna de la Merced property, the laying out of a highway into San Mateo County, and other important matters, will all be considered.

Fortunately, we have in Mr. Burnham an experienced master for this great task, for since he directed the construction of the famous "White City" of the World's Fair, he has made plans with reports thereon for Washington, for Cleveland, for portions of Chicago, and more recently for the reclamation and extension of Manila, as well as for the creation of a summer capital of the Philippines to be called Baguio.

While his scheme for our city will form the basis of the improvements the Association will agitate, we will meanwhile favor those metropolitan essentials in which San Francisco is lamentably deficient. Of these, first in importance perhaps is a mammoth fireproof auditorium for the holding of large gatherings, conventions, bazaars, exhibitions, fairs, public balls, congresses, etc. It is also urged that a grand opera season should become one of the educational and social features of the community, as there is nothing more important for the attraction and entertainment of strangers. Therefore, an opera house, centrally located and of monumental proportions, should be provided. Moreover, a College of Music is proposed, in order all the more to develop the musical taste, and to place a general musical education within the reach of those who desire it. It has been shown how such an institution could be made a dividend-paying investment.

Passing to matters for private philanthropy, the Association has not been backward in making suggestions. Already, in accordance with a recommendation that appeared in its original circular, we are gratified to

learn that a prominent capitalist will soon donate a fine aquarium to the city. Besides its instructive functions to the people, this project will aid the cause of science, for, as has been remarked by the eminent zoologist, J. H. Bentham, "it is only by studying the habits of the denizens of the ocean in some place where they can be constantly under observation—such as a great aquarium where the conditions of their captivity should resemble as much as possible their native habitat—that we can ever hope to fathom the mysteries of the great deep, and ultimately have at our command the treasures of the sea."

Another improvement which the Association has recommended is an open air amphitheater in one of our public parks. As our climate will admit of its use during nearly three hundred days of the year, it would be of inestimable service to the people, particularly since their highest nature may there find expression in music, oratory, poetry and the drama.

Moreover, to afford proof that San Francisco has the noblest site of the cities of the earth, it has been suggested that an observatory be erected at the summit of Buena Vista Park, which perhaps commands our finest view of town, bay and ocean. Here our inhabitants and tourists may seek inspiration from the unparalleled natural beauties that surround us.

An art museum worthy of as great a metropolis as ours is also to be desired. Such a museum should have great halls for pictures and sculpture and be of fireproof construction. Its galleries should contain the city's permanent collection, to which gifts would no doubt be made from time to time, and valuable works loaned.

As a matter of course improvements like those here advocated, apart from their utilitarian functions, will, if realized, help to make San Francisco a city of beauty. However, this can perhaps better be done by generally improving our architecture. For that reason we might well protest against the character of most of the buildings, particularly flats and apartment houses that are being erected outside the "fire limits" of the municipality. These houses have not inappropriately been dubbed "architectural shams of lumber and paint"; and if by its influence the Association can induce the proper authorities not only to make the building laws more stringent than they now are, but to enlarge the "fire limits," it shall, in my judgment, have performed a great public benefit. By making the structural standard higher, since "beauty in architecture depends greatly upon stability of construction," it follows that the cause of Art would thereby be served.

In like manner, the Association is directing its energies towards interesting the people in the floral adornment of their houses. Indeed, while magnificent parks may be designed, and sumptuous structures planned, such projects must take time and capital to realize, whereas the simple and inexpensive process of generally beautifying our homes with flowers and greenery will tend to give a charming effect to every block equally from one end of the city to the other. A dark yucca rearing along the house front, a clump of evergreen, a patch of lilies in the front garden, and a window box laden with geraniums, detract attention from defects of architecture, and relieve what would otherwise produce an ugly effect.

In conclusion, it should be borne in mind as we consider our civic needs, that private beneficence may follow suggestions when coming from an authoritative source, and our citizens can thus leave after them monuments which will at once be enduring, beautiful and useful.

The San Jose Meeting

IN all the great work of building up a commonwealth, there is nothing so vitally important as that those who are actually engaged in the steps which make for its progress should know one another.

There is a fascinating human interest story in the somewhat unusual work that is being undertaken in California to develop this great State. There is in California about 150 Chambers of Commerce and Development Organizations.

Only by being acquainted with representatives from all sections of the State and the character of the country from which they come, can any representative of a commercial organization do himself, the organization he represents and the State justice. The semi-annual meetings of the Counties Committee of the California Promotion Committee have done an immense amount of good in bringing about a gradual feeling of co-operation and acquainting officers of the different development organizations and those interested in the work with one another to the best methods to pursue. To-day you will find no representative of any commercial organization in California who will speak ill of another section. He will always cheerfully give the facts and will never tell a new-comer or new industry to go to his locality knowing that that settler or industry are looking for requirements which would be better suited in another region. By all pulling together, Californians are achieving great results.

The next meeting of the Counties Committee of the California Promotion Committee will be held at San Jose on May 20th. This is the third semi-annual meeting, the first having been held at Sacramento and the second at Pasadena. Every one interested in this great work in California is urged to be present. Already a great number have signified their intention of being on hand and there is every reason to believe there will be a rousing meeting. Every one will participate in the meeting and a banquet will be given in the evening.

* * * * *

SIXTY MILLIONS OF DOLLARS FOR TABLE AND CHINA WARE?

Millions of dollars are sent out of California for pottery and china table ware, floor tiling for vestibules, terra cotta ware of all descriptions, etc. There is kaolin and clay in California in sufficient quantities to make much of this ware. There is glass sand sufficient to make all the glass needed here. The china table ware industry alone is one of immense proportions and should be encouraged upon the Pacific Coast. The California Promotion Committee, from recent estimates obtained throughout the State, bases the present population of California at over two million people. At an average of five to a family, this makes 400,000 families, so if each family spends fifteen dollars a year for its china ware, then sixty million dollars is sent out of California every year for table ware. Of course, a large portion of the population is floating and in boarding houses, lodging houses, hotels, restaurants, etc., but in these places it is probable that more china is broken than in families. Everybody almost uses china table ware unless he resorts to the tin cup and plate and the first natural method of dining.

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(THE STATE CENTRAL ORGANIZATION)

THE PURPOSE OF THE COMMITTEE IS TO GIVE TO THE WORLD RELIABLE AND UNBIASED INFORMATION REGARDING THE RESOURCES OF AND THE OPPORTUNITIES IN CALIFORNIA. FOR CALIFORNIA IS PUBLISHED TO ASSIST IN CARRYING OUT THE OBJECTS IN VIEW.

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MEMBERS OF THE SIERRA CLUB ON ONE OF THEIR SUMMER OUTINGS.

California as a Summer Resort

THE EDITORS

FAMOUS the world over as a winter resort, California is destined to achieve an equally great reputation as a summer resort.

There is such a wonderful diversity of agreeable climatic conditions in the Golden State that even those who live here may obtain a healthful and tonic change from the regions in which they are accustomed to live.

The dwellers in California's great interior valleys, in Arizona, Nevada, and Texas, are already seeking the seacoast resorts of California during the heated summer months. Indeed, the people of Arizona, Texas and Nevada are the first of our visitors to have discovered the attractions of Pacific Coast watering places in summer. They will be followed in greater numbers by visitors from the Eastern and Middle West States, some of whom have already made the discovery. In summer the Pacific is delightful. There are fascinating stretches of sandy coast and picturesque rocky shores. The absence of great storms and the prevailing fair winds lend an especial invitation to yachting. The summer fishing upon the coast is unexcelled. The giant sea bass, the great leaping tuna and the yellow tail have already attracted the attention of European fishermen. The disciple of Izaak Walton goes after big game with rod and reel, and he gets the finest deep sea fishing in the world.

The city dwellers in California also patronize the coast resorts. They bathe; they fish; they get sunburned; they rest. In short, the mild, cool—but not in the least chilling—climate of the Pacific seacoast of California is especially alluring as a summer resort. Although comparisons are invidious, yet as a matter of information the hot, burning, breathless days of Atlantic Coast resorts are seldom if ever found at the Pacific Coast watering places.

Then there are the mountains.

The Sierras, with their lofty, snow-clad peaks, their great forests of pine, their sparkling mountain trout streams, their lovely lakes set like gems amid precipitous walls of granite and fringed with the dark green of forests of fir, with their big game in season, offer a remarkable and unusual contrast to the peaceful, happy monotone of the seacoast.

The resorts of the Coast Range have less of grandeur, perhaps, surrounding them than have those of the Sierras. But they have a charm all their own.

The Sierra Nevada Mountains are grand as those of Switzerland. The Sierra Madres (or Coast Range Mountains) are like the mountains of Italy, warm in tone, thickly clad with trees and verdure, yet often possessing charms excelling those of Italy, for nowhere else but on the Coast will you find the giant redwoods lining the great canyons. Sometimes the Coast Range in sublimity approaches the Sierra Nevadas.

While hundreds go to the mountains in summer, yet there remain a thousand undiscovered charms to be made known by the man and the woman, too, who will ride or tramp in the cool summer days through the great forests and along the mountain streams.

In California there are many well-maintained resorts. There are mineral springs where the visitor finds first class accommodations and where he may take advantage of the healthful mineral waters. It is a fact that few persons know of the hundreds of resorts of this kind in California; yet the mineral waters of this State are not excelled by the famous watering places of Europe. In summer these California watering places are open and thousands visit them.

California has room and attractions as a summer resort for the whole world. The greatest thing about its attractions as a summer resort is that it offers a diversity of charm and conditions that will meet every requirement.

A Few Words About The Sierra Club

MISS MARION RANDALL

THE Sierra Club's yearly outings to the high mountains have become quite well known throughout California, hardly more from newspaper accounts than from the rhapsodies of the returning members of the party. One hundred and fifty different enthusiasms come home from the outing every summer and are spread broadcast to arouse the envy or scorn of the enthusiasts' friends. This one glories in the mountain climbs, that one waxes eloquent over the trophies of the rod, one takes delight in the campfire gatherings and the social side of camp life on so large a scale, another in the wonderland that every mile of trail reveals—Titan lands of forest and mountains, or fairy worlds of tiny, busy creatures dwelling in the elfin forest of the meadows. But all temperaments (save possibly that of the recluse) unite in voting the happy-go-lucky weeks a most delightful experience.

So much has been said of these trips to the Kings and Kern River Canons, to the Yosemite and Tuolumne Meadows, of the climbs of Brewer, Whitney, Williamson, Ritter and Lyell, which have been such picturesque and interesting features of the summer expeditions for four years past, that the question is sometimes asked whether the Sierra Club only pays attention to the "big game" among mountains, and whether the wonders of the Sierra Nevada make us indifferent to the lesser beauties near home. Within the last year a series of local walks has been instituted to points of interest near San Francisco, and similar expeditions have been taken in the vicinity of Los Angeles by members of the southern section. Two day trips have been made to Mount Diablo and Mount St. Helena, while delightful one day tramps have been enjoyed almost weekly by small parties of from ten to thirty members. We do not have to go very far afield to find oaks and redwoods and great high hills overlooking a wide sweep of ocean and hills and sky. Marin County is particularly beautiful, especially in spring time, when the streams are full and the tender leaves of the alders and maples scarcely darken the yellow sunlight beneath their branches; when the hills are covered with baby blue eyes, iris, and yellow poppies, and great masses of wild lilac clothe the canon sides with a veil of purple. The San Bruno hills, too, rising in apparent barrenness behind San Francisco, have a charm all their own in flower time, wind-swept gardens of starry yellow blossoms stretching upwards to meet a blue sky, with a glimpse, now and again, of the white-capped bay lying far below in the notches of the hills.

One rule is rigidly adhered to on these walks—no Sierran may add to the unsightly traces of picnic lunches which disfigure many a beautiful place as far as the cheerful picnicker penetrates. It is reported that one punctilious member spent her noonday hour on Clouds' Rest in collecting into one orderly heap the sardine cans that bestrewed the mountain top. Dame Nature, lavish hostess that she is, has no protection against this common abuse of her hospitality; but one cannot help wishing that there were some way of banishing from her halls the ill-bred guests who show her such scant respect.

The lighter, social part of the Sierra Club is often dwelt on, to the exclusion of the serious side of its work—its constant efforts to help in the preservation of the forests "and other natural beauties of California"; "to render accessible the mountain regions of the Pacific Coast"; "to publish authentic information concerning them"; to quote from its articles of incorporation. This is the Club's real purpose for which it was organized in 1892; the outings, inaugurated nine years later, were meant only to increase the interest and appreciation and to aid in the furtherance of its work.

Yachting on the Bay of San Francisco

THOMAS JENNINGS,
Commodore Corinthian Yacht Club

THERE is probably no place on earth better adapted for yachting than the Bay of San Francisco, as the conditions here are ideal, both from the cruising and racing yachtsman's standpoint.

The yachting season opens about May 1, and closes November 1, but there are no good reasons why the sport cannot be indulged in all the year, as during the winter months the weather is generally bright and sunny, and while the winds are much lighter than in the summer, there is usually enough wind to carry one to any part of the bay, and what storms we do have during that period, are few and far between, and the Eastern yachtsmen passing across the bay during the winter usually wonders why on such a magnificent bay he sees so few yachts, but I suppose the only reason is that the average yachtsman gets enough of the sport and enjoys such ideal conditions during the summer that he thinks both his boat and himself need a rest for a few months.

The Bay of San Francisco and its tributaries are so large and the climate so varied in the different parts, that the yachtsmen can find almost anything he wants. In the channel the wind blows through the Golden Gate strong and steady, the tides and currents run swiftly and the water is rough enough to lend snap and excitement to the sport. In the upper bay, along the Marin County shore, the winds are lighter and the air warmer, and farther up in San Pablo Bay it gets rough enough at times to suit the most daring yachtsmen. During the season you can always be sure of plenty of wind, regattas and cruises can be planned months ahead, and such a thing as a postponed race for lack of wind is rarely heard of here.

The racing yachtsman has nothing to complain about. Many fine courses can be laid out on the bay, where the wind is always strong and true, with no calm spots and baffling winds to contend with; the tides and currents are swift and changing, and keep the helmsman guessing until the finishing line is crossed.

The usual risks that generally attend the sport are very small here. The boats are designed and built to meet the strange conditions, and while we travel through the water about as fast as the Eastern yachtsman, we do so with about one-third less sail, and are not compelled to use the lofty rigs that the Easterner does, and such a thing as a yacht being capsized by a sudden squall is a very unusual occurrence.

The sport of yachting is well established on the bay and many well-organized clubs have their stations about its shores. There are many beautiful nooks and coves about the bay that can only be seen and enjoyed by the yachtsman. Such places as Paradise and Corinthian Coves, San Pablo Point and many other places too numerous to mention form fine places to anchor for an overnight cruise. Sails up Napa, Suisun and Montezuma Creeks cannot be excelled anywhere; trips to Vallejo and Alviso are always interesting, and longer trips through Suisun Bay and up the Sacramento River with its maze of creeks, sloughs and cut-offs, form ideal and endless cruising grounds, and while it is impossible for me to describe the delights and beauties of these trips, I may add that to thoroughly enjoy and appreciate the many beautiful and wondrous places about this magnificent bay there is no better place than from the deck of a yacht.

REAL ESTATE SALES IN SAN FRANCISCO IN MAY.

There were 764 sales of real estate recorded in May, with estimated considerations aggregating $5,745,000.

Some Wild Flowers of California

INA COOLBRITH

AN Eastern visitor to our State once said to me that "While our domestic flowers graced the entire year, instead of only a portion, with a greater luxuriance of bloom, yet they lacked the perfume of those of the East, and as for wild flowers, we had none." Whereat I looked my amazement, For surely, few lands, if any, can boast a more diversified and beautiful flora than that of California, from the shy spring-born wood anemone of mossy banks and forest spaces, to the midsummer azalea, beloved 'specially of the Yosemite; from the humble yerba buena, the "good herb" of the Indians and early Mission days, to the gaunt, weird yucca palm of the desert.

I remember the wild mustard of the plains in the old days, leagues upon leagues of it, thickly sown as a field of grain, in which one could lose oneself as in a jungle—so tall that it topped the stage-coach as it passed; and the great areas ablaze with the yellow disks of the sunflower, which could give to the tired traveler shade and shelter in its ranks from the noonday heat, and furnished in the autumn a harvest of seed-food to the cattle herds. And the California poppy—"El copa de Oro," indeed—the splendor of which not even its later acquired name of eschscholtzia can dim!—which, tradition says, so mantled with its orange sheen the shores and the portals to the Bay of San Francisco at the time of the harbor's discovery as to be the inspiration of the name it bears, the "Golden Gate."

Not many are the wild flowers known to New England and the Mid West not duplicated here, for the climates of California are many—while a multitude which could not bear the rigor of their winter months are sown broadcast throughout the State's extent. We may not see that dainty first-ling of their year, the snowdrop, but lifting through the white drifts of the Sierras is the marvelous snow plant, of which the poet* has sung:

"How perfect has thy stature grown,
Thou waxen rosy-tinted cone!
A flame incarnate thou!
All fruits are compassed in thy zone,
All blossoms thee endow."

The trees and shrubs of canon and hillside have their distinctive bloom. The noble laurel, with its clean, polished leaf; the madrone and manzanita, flowering in pale green, and white, and pink; even that bane and ban of the country-side, the poison oak, is beautiful with small greenish flowers and gorgeous foliage, luring to disaster; the wonderful fern-world, with the delicate saxifrage in its midst; daisies and primroses and buttercups; cups called "gold" and "cream" and "sun," all filled to the brim with perfume; purple lupine; blue harebell; heartease; "shooting stars," or cyclamen; golden yarrow; calypso; wood-balm; pansies; violets, purple, white and blue; the harebell, prettily styled the "lantern of the fairies"; fuchsia, or "humming bird's trumpet"; Indian pink; Indian paintbrush; columbine; Canterbury bell; nemophiela, or "baby-blue-eyes"; trillium, or wake-robin; gilia in endless variety; pussy's ears; lilac; hyacinth; sand verbena; the iris, purple, white and yellow; the lilies—what a group!—white, black, brown, lemon, ruby, the leopard, the tiger, the fawn, the chamise and the coast lily, the little Alpine and the beautiful Mariposa lily (or poppy), hovering like a "butterfly," indeed, above the grasses; the wild rose; the larkspur; morning-glory; the wonderful Matilija poppy, with stems from two to fifteen feet high and blooms from six to nine inches across; the bleeding heart; the ice plant; the cacti, queen of sandy places, many of kind and gorgeous in bloom colors; and the world of minute blossoms of which I shall name but one, the trientalis, a small, tender plant bearing its tiny pink stars on a stem so thread-like as to be almost invisible. I learned

to love it from a never-to-be-forgotten day in the redwoods with John Muir, who chose this dainty blossom to weave in a tissue of beautiful fancies, and from which to draw a gospel divine.

How few of the wild flowers of California have I space to name. Those who would know of them and have not opportunity to seek them on Nature's breast, I would refer to Rattan's "California Flora" and "The Wild Flowers of California," by M. E. Parsons and M. W. Buck. This last deals with over five hundred varieties, I believe. There, too, will be found the Latin names of them, which from love of the flowers I have omitted! And if one should wish to see the perfect counterfeit presentment of them upon canvas, let him seek and find it in the studio of Mrs. Alice Chittenden, chieftest of flower-painters, whose art has been doubly inspired through love of her subject.

"No wild flowers in California!" The track of the Southern Railway runs for some distance along the Mojave Desert. One day in the May month I saw from the car windows a carpet of bloom stretching as far as the eye could reach, made up of every variety of color and tone and shade of color under the sun—more wonderful in combination and harmony than could ever come from the far-famed Persian looms; and I wondered at the name of desert applied to this marvelous region which a few drops of rain-moisture could make to "blossom as the rose."

INA COOLBRITH.

WALKING

WILLIAM GREER HARRISON,
President of the Olympic Club

WALKING is an index to character. Study the man or woman in natural motion and you will have no difficulty in interpreting character.

Alas, few men and fewer women know how to walk. Both seem to present the varied forms of locomotion indulged in by our several ancestors. There is the jerky motion of the ape, the side gliding movement of the bear, and the twisting movement of the less gainly of the lower animal kingdom.

Few of the present generation can be said to "Walk with God"—so sloppish is their walking.

Heel and toe; yes—but it's on the heel always, toes in the air: pounding the spine all day long, and wondering why they have headaches. They have overlooked the " 'ammer, 'ammer, 'ammer on the 'ard 'ighway," the heel being all of the foot used and the spine subjected to a continuous shock.

Natural walking is a splendid execise. Every time the limbs are moved the intestines are gently massaged and the vital organs toned up and encouraged to work.

The lungs are oxidized and the skin made to do its duty by rapid walking.

The health-life is earned by out-of-door work, and walking is the agency through which the best results are obtained.

A plain woman, who walks naturally, becomes attractive. An ugly man overcomes his ugliness by the grace of his movements.

The most beautiful face cannot save a woman if she "shuffles."

The man who walks on his heels is ugly and vulgar, no matter what his facial attractions may be.

What is walking? It is a long, easy glide forward—noiseless and sure—the foot work being done with the forward part, all the weight of

the movement falling upon the ball of the foot. The body should be held free and loose, inclined forward, but never slouchy or slovenly.

The light stroke or push of the forward part of the foot is the propelling force. The propulsion should be noiseless, except when used against hard substances. The heel should never touch the earth with any degree of force.

The stride should be in proportion to the length of the legs. The longer—proportionately—the stride is, the more graceful the movement becomes.

The short, choppy movement is horrible, because it is unnatural. No animal, except man (particularly woman) signals its approach.

Then there is the joy of walking. No other form of exercise gives the special happiness which is the earned value of the walker.

The hill and valley are his playgrounds. The climb excites a healthy ambition to surmount difficulties, and the short run sets his blood humming with a music that lifts his head and heart heavenward.

The big forest and the mountain top are his cathedrals. Walking through the Sequoia forest his eyes follow the tall spars, the beautiful, uplifted foliage of the giant redwood, until they rest upon the eternal blue of a California sky, and he asks what is the mystery behind the clouds with a sense of certainty that the answer will come in a form to increase the joy of living.

Or he rests upon the mountain top—hatless—breathing great tonic breaths of pine-zone, emolient and grateful; breathing in at the same moment the peace of God which passeth all knowledge, and gratefully thanks the Creator for the joy of the hour; he rests and is devotional.

Ah! then the return walk; the swish of it, the lilt of song in it, the manliness of it all—down the mountain sides, through the brakes and ferns, swinging along with a pride of movement and a heart in love with all nature, in sympathy with every creature that lives and moves.

No spot of earth lends itself more beneficially to the joy of the walker than California—the paradise of the pedestrian.

How any man can waste his hours indoors when wild flowers are calling him out, sparkling water sprites laughing at his foolishness, great trees offering him their umbrageous welcome, the brook, with its trout, singing its friendly songs for him, and all things that are beautiful in this, the most beautiful of earth-scapes, calling him, is a riddle.

The climate of this State permits all-year out-of-door life, and to be out in the open is to be alive, full of life, to be happy, full of happiness. The man or woman who walks has a personal kingdom, a royal domain, where nothing common or vulgar offends the eyes. Only in cities do you find things that are vulgar. Only in cities do men grow small and waspish —out in the open he broadens and grows. He loves nature, and nature repays his love a thousand fold.

Physical joy is not the only blessing that walking earns. There is the moral side to be taken account of. The eye is blessed with the evergreens, so rich in color throughout this State; but passing these and moving into the deep seclusion of the woods, we become meditatively happy in contemplating the infinitude of God's gifts to man. We see Him in the the forest, Beneficence itself. We are removed from the sordid side of life, its smallness, its meanness and all the accompanying irritants which mark the struggle for place. Our environment is pure—and our thoughts take on the character of our surroundings.

We introspect, and much of the mystery of life is revealed to us.

We build up character by meditation, comparison and straight thinking, and in the woods and on the peaks we realize more clearly than anywhere else the value of clean living.

Our moral fibre is strengthened and our whole nature toned up to active and intelligent progress.

Wild Game of California

H. T. PAYNE,
President California Fish and Game Protective Association

THE game of California is found in too great variety to be treated as its importance merits in the restricted space which can be allotted to it here. There is no state in the Union which has, or at least had, so wide a range of game birds and animals. All the large game of the United States, except the buffalo, the moose and the Rocky Mountain goat, are found in California. The grizzly bear, the most intrepid of all animals, is a "native son," found nowhere else. The so-called grizzly of the Rocky Mountains is a baby, both in size and ferocity, compared with the true article of California, which in early days were commonly met with weighing from 1500 to 2000 pounds. I saw one killed near the Green Lode mills, in San Bernardino County, which when weighed on the ore scales tipped the beam at a little over 2200, and I helped to kill one later that I am sure was even larger still.

Besides the giant grizzly, which is distinctively our own, we have the black and brown bear, as well as the mountain lion, the lynx, the wild cat and others of the like, which we of the West have not yet begun to class as game. To these can be added the elk, the antelope, the deer and the mountain sheep; a showing in big game equaled in but few places, if at all.

In feathered game the State of California occupies a class by itself, both in variety and in quantity. This is especially true with our waterfowl, which has a range of species found nowhere else. And nowhere so plentiful. Beside the swan, we have every variety of the goose family found in any part of North America. These include the Canada goose, or "honker," the white-cheeked goose, the Hutchins goose, the small black brant, the sea brant, the white-fronted goose, the snow goose, the Ross goose, the blue goose, the Emperor goose and the barnacle brant. The three latter, however, are met with only occasionally.

In ducks the variety is still greater. Of the anatinae, or fresh water ducks, the mallard, the gadwell, the widgeon, the pintail the shoveller, the wood duck, the fulvus tree duck, and the green-wing and cinnamon teal are all plentiful. Of the fuligulinea, or salt-water ducks, we have the canvas-back, the red-head, the greater and lesser scaup duck, or blue bills, the ring-neck, (the ring not showing in the winter months. This duck is generally compounded with the greater scaup) the golden-eye, the ruddy and the butter-ball. To these can be added a few other species that are occasional visitors, besides several species of the eiders and all the scoters. In fact, there are only three edible ducks in America, the dusky duck, the Florida black duck and the blue-winged teal, that are not regular visitors to this favored land. Of the limicola, or shore birds, we have about them all, except the woodcock. The list is too long to particularize here.

In the tetraonidae, or upland birds, we are not so well supplied. Though I doubt if any State in the Union has as many species as this. In the northern part of the State sage hens, the largest of the grouse family, are quite abundant. Along the northern boundary quite a number of ruffed grouse are to be found, and all along the Sierras the sooty and sharp-tail grouse are quite numerous. In the Coast Range from about the latitude of San Francisco north there are an abundance of that species of the mountain quail known to the naturalist as the oreortyx pictus, while the sub-species of the same genus, known as the O. p. plumiferus, makes its home in the Sierras as well as the Coast mountains from San Francisco south.

But if we have no prairie chickens and no wild turkeys, the Creator has made ample amends in giving us an abundance of the gamiest little bird that flies, the California valley quail. Of these we have three varieties —two species and a sub-species. The one, the lophortyx californicus,

inhabits the valleys and foothills north of the bay of Monterey, while its sub-species, the l. c. vallicola, finds its home throughout the rest of the State and south into Lower California. The lophortyx gambeli, called Arizona quail in California, and California quail in Arizona, which is really its home, has crossed the Colorado river and spread some distance to the westward along the desert, and in San Bernardino county as far north as the Panamint range.

It is true that through our lack of foresight in not providing better protection, we have allowed our once bountiful supply of game to become much diminished. Our elk and antelope, once very numerous, have been practically annihilated, and the grizzly monarch of the mountains is nearly extinct.

But while we can yet boast of a great variety, and even yet a goodly supply, it is not these alone that makes California the peerless paradise of the sportsman. As most game must be hunted in the fall and winter months after the season's young have reached maturity, the genial climate of California plays an all-important part. With us every day is a sportsman's day, on which he can go afield unincumbered with heavy wraps, even into the marshes after waterfowl. If his fancy leads him to that grandest of all wing-shooting, the valley quail, he goes in a light hunting coat, and needs it only to carry his shells and game. He sees snow, it is true, but it glistens from the summits of the distant mountain peaks, just far enough away to give a bracing freshness to the air. Think ye, snow-bound sportsmen of the East, where blizzards rage and the ice-king holds all nature in his frosty grip, of shooting quail in the valleys of California, with a cloudless sky above your head, and under-foot a flowery carpet of huge mosaic patterns wrought in blue and scarlet and purple and gold.

FROM BIALSTOK.

The California Promotion Committee has received the following letter from Mr. W. N. Ent, Secretary of the San Luis Obispo County Board of Trade:

"I am just in receipt of a letter from Bialstok, Russia, in which the writer refers to my little article in the September number of FOR CALIFORNIA. It may be of interest to you to know how much FOR CALIFORNIA travels. Yours truly, W. N. ENT,
"Secretary San Luis Obispo County Board of Trade."

The following statement occurs among other things on Mr. Ent's letterhead:

"Nature never made a better climate. Area, two and a quarter million acres, comprising lands of wonderful fertility, insuring heavy and unfailing crops of every product that can be raised in California. Single acres of Luis Obispo County soil have produced without irrigation or fertilizers 2 1-2 tons of beans, 20 tons of potatoes, 33 1-3 tons of onions, 60 tons of squash, 70 tons of beets, 100 tons of carrots, 16,000 quarts of strawberries. The weight of single specimens have been: Apple, 24 ounces; pear, 30 ounces; potato, 10 pounds; radish, 26 1-2 pounds; carrot, 40 pounds; table beet, 50 pounds; sugar beet, 56 pounds; mangle wurtzel beet, 156 pounds; cabbage, 93 pounds; squash, 272 pounds.

In the last three years, we have increased our bank deposits $1,684,-890.35; in the same time our assessment roll has increased $1,366,604, and the assessed value of mortgages has decreased $669,358. Thus we have added to our wealth in three years $3,720,852.35."

The Brown Family in California

By JASON BROWN

CHAPTER FIFTEEN

IN WHICH NEIGHBOR SIMPSON TELLS ABOUT OUT-OF-DOOR LIFE IN CALIFORNIA FOR BABIES

"HAVE you heard the news?" asked Simpson, flicking his team gently with a whip.

"What news?" I asked.

"Whoa, boy, whoa," replied Simpson. "Strange how this team wants to be up and doing. But that isn't it. There's a stranger on the old Estudillo Rancho grant."

"Well, that's good. I'm glad Eastern people are beginning to learn a little about the opportunities for farming in California," I said.

"But this isn't an Easterner, and he isn't going to be a farmer— at least not yet a while," said Simpson. "This young man came in with the storks. Mr. Paulsen has a ten-pound boy."

"Oh, isn't that just lovely. I must go over and see him," said my wife. "I do hope the little fellow will get along ever so well."

"Of course he will, ma'am," said William Simpson. "I'm not a-going to exaggerate about California, but I do say that it's a good country to bring up your children in. You remember that Schoolteacher Bradshaw sent his wife and baby back to her mother's in Des Moines, Iowa, last summer. It's pretty hot traveling through the Middle West in summer, and by the time they got to Des Moines the little one was pretty near dead with the heat and teething. Then it kept hot all summer, and, you know, that isn't good for babies. The little chap fretted and had prickly heat and a lot of other things that babies have and men don't know much about. Well, Mrs. Bradshaw couldn't come back to California, for it was too hot to think of traveling on the train. And she hated to stay there, for the baby kept getting sicker all the time. By and by she thought she'd just have to make the trip and take the risk. Well, when she got to Kinney's Corners I thought I never saw such a poor, peaked young one. But the schoolmaster up and said they'd have to take him to the seashore, and so they did, and now, sir, that little fellow is the healthiest, happiest, fattest little chap you ever did see."

"Yes, indeed, the change did him good right away," said my wife.

"Of course it did, Mrs. Brown," replied Simpson. "You can't find a fatter, healthier baby in the township than this one."

"And of course Mr. Simpson is such an enthusiast that he thinks it's all due to California," said our Ethel.

"Perhaps not all of it, Miss Ethel," said Simpson, "but at least a great part of it. You see, children in California can play in the open the year round. The out-of-door life is the natural life. All children need is a chance to grow and they will grow. Here in California the children are not kept in the house most of the time in winter. Some one has said that California babies are the prettiest babies in the world. I think it's because they're healthy, for in my opinion perfect health is a synonym for good looks."

"Well," I said, "here comes Mr. Paulsen himself. Perhaps he will tell us something about that new baby of his."

Paulsen, you know, worked for me with his team when I first started our California farm. Paulsen is a fine young Swedish man. He owns twenty acres of land and the way he earned it is one not unusual in California. He and a partner had earned enough to make a first payment on forty acres. The partner stayed home and worked the ranch and what Paulsen made by working around they paid on their property. Then Paulsen and his partner each took twenty acres, and when the little home was built, Paulsen and his sweetheart were married. I recalled these

things as Paulsen came up the road, for he had come to California about the same time that we had, and by ingenuity, industry and integrity earned his own home.

"Paulsen," said Simpson, "we've heard the good news and want to congratulate you."

But Paulsen blushed rosy, and so we showed our appreciation later by presenting the happy father with a handsome baby carriage.

(To be continued.)

Out-door Life in California

EVERY activity in California is influenced by its out-door life. Its art, literature, science, agriculture; its commerce and its industries; and its people, perhaps most of all, have been moulded by an all-the-year-round climate to an extent hardly believable at first glance.

Art, literature and science are most difficult to classify, for, as it is often said, they belong to all the world. While this is true; while all the world may share and delight in the art of a Velasquez or a Rembrandt, in the stories of Hans Christian Anderson, Alexandre Dumas, in the creative genius of Luther Burbank, yet the contributions of these wonderful men to the world have been strangely colored by the lands in which they lived, and as long as man remembers them or their work, he will associate them with their environment.

So it is in California.

Who can separate Helen Hunt Jackson and Bret Harte from California? There are many other writers whose pens have been steeped in the very breath of California. So it is with our artists, who may have a setting not to be found anywhere else in the world. Palms and firs side by side, a giant redwood, the Sierra foothills—these are unmistakably Californian.

Outdoor life and the God-given climate which permits men to live naturally in the open the year round mean everything to California. It is part of California.

Agriculture in California exists to an extent unknown in other countries. Not that California is as yet the greatest agricultural producing country in the world, for this young State has not yet achieved the full measure of its possibilities. But the agriculture is unique, for there is an out-of-door climate the year round for plants as well as for men. With irrigation, climate and soil, there is a continuous season of agriculture.

Our industries in California are affected by our agriculture. There is no closed winter season which pens up the stock and confines the farmer to his home, indirectly affecting manufacturing industries. Our sturdy workingmen do their honest labor the year round and are not confronted by coal bills. Our commerce, even river commerce, is open the year round. There is no ice to prevent boats running on inland waters while the commerce of the sea in winter is not rendered difficult by terrific hurricanes.

But the people of California—these are the most interesting, for it is the people who make the commonwealth. We are all favorably influenced by our out-of-door climate and environment. People begin as children, of course, and it is said that California children are the healthiest in the world. It is always out of doors with them. People say that California women are stronger and larger than their sisters in the East. A census of Stanford girls and those of an Eastern college seemed to bear out this theory.

Anyway, the spirit of a people is the most important. It is no wonder that Californians are loyal. They are Americans first and Californians

afterward, and they are the most loyal of all Americans because they love their own State and exhibit their devotion to California to a degree not known elsewhere.

So California invites all the world to share with it in whatever it has been endowed by nature.

AN INVITATION OUT OF DOORS

CHARLES KEELER

THE song of the open road, the lure of the wild, the cry of out of doors has been the sanest, most hopeful, most reassuring, amid all the notes of this feverish latter day of city herding and scrambling for gold in the crowded market places. Over against the tenement and apartment houses of the metropolis we see the vision of the country home. In lieu of cobblestones and asphalt is the pavement of sward and flowers. Clanging bells and rattling wheels yield precedence to the glad bird-voices and the stately rustle of the wind in forest trees. In contrast to the strife of the city is the sedate life on the farm, where a man may be master in his little domain, sowing and reaping, gathering his fruit and making a living from the increase of his flock and herd.

All men, to be sure, are not adapted to a pastoral life. Many need the stimulus of the crowded city. Some would die of inanition and loneliness if the hurly-burly of the city were no longer about them. But the broad fact remains that economists have come to look with grave concern on the growing tendency of men to crowd into the cities. Back to the soil, back to nature, is the warning cry to-day.

In few lands is the invitation of the out of doors so alluring as in California. Everywhere in this favored region there is a bigness in the landscape that takes hold of men's imagination. The grandeur of the mountains, the far sweep of purple valleys, the Pacific Ocean, thundering down the long reach of coast, the mighty forest trees, the strange fascination of the desert —what interminable wealth of beauty is to be had here by all who will but walk in the open! And yet we are by no means availing ourselves to the fullest of this bounty. We are not even conserving that which is our most precious heritage—our forests. In our unwisdom we are training hundreds of our finest youths to delve in the ground for precious metal that would last as long as the foundations of the earth, and leaving our forests to the unskilled and unloving care of lumbermen, who hew and burn and devastate to-day, caring nothing for the ruin of to-morrow. There is no more pressing need in California at the present time than a school of forestry at the State University and an awakened public sentiment on the irreparable loss we are sustaining in the wanton destruction of our timber.

In California there are vast tracts of fertile valley land untenanted. We need people to cultivate the resources of the country. We need a rural population. But this settling of the wild places does not necessarily involve a ruin of all natural beauty. The modern farmer is a man of more education than his prototype of an earlier generation. He has learned among other lessons that there are things to be gotten out of a rural life other than pigs and potatoes, and that chief among these insubstantial gains comes from an enjoyment of the beauty of nature.

Compartively little thought has thus far been given to making the farmhouse a beautiful building—beautiful in its fitness to the landscape, in its reserve of color and harmony of lines. A building of natural rough stone or of unpainted wood, if made with broad, simple sweep of roof, wide eaves, and windows broken into panes of small size, the whole building setting low upon the ground, cannot fail to be picturesque. In such a farmhouse, adorned with vines and flowers, sheltered by clumps of shade trees and sur-

rounded by well-tilled fields, by orchard and grove, a man of taste may rear his family in the enjoyment of those few great tokens of world civilization—a shelf of noble books, some photographs of the master painters, and such bits of handicraft as he may require. Thus fortified, he may scorn the artificial pleasures and excitements of the city, knowing full well that the richest joys of life are within hail.

I would that the various local Promotion Committees of California might pay some attention to the making of attractive rural homes, for no inducement could be more persuasive in attracting the right sort of settlers to this land than the vision of a quiet, unostentatious, yet beautiful country home. If some of our best architects could be interested in designing modest farmhouses, and in laying out farm land as a landscape gardener lays out a park, it would take hold of the imagination of numberless people and persuade them more irresistibly than any array of facts concerning the yield of an orchard, the size of the pumpkins or the productivity of a beet sugar field.

Man cannot live by bread alone. In California we are coming more and more to appreciate the importance of beauty as a factor in a well-rounded life, and to realize that the truest types of beauty created by man have their inspiration in the life of the great earth mother—in the everlasting hills, the eternal blue of heaven with its ever-changing pageant of clouds, in the forest with the myriads of wild creatures finding shelter therein, in the green fields, and the flowing streams. The child schooled in the craft of the open will have a grip on life, a poise, a primal understanding which is seldom attained by one who has only the cunning of the city streets, the polish of metropolitan convention, and the polite breeding of the town. If, then, we would have a sane and hardy manhood in our civilization, let us preach the gospel of the simple life, the joy of the hills, the power of nature when made to yield its store of beauty and strength to the compelling imagination of man.

THE FIFTH EXCURSION OF THE CALIFORNIA PROMOTION COMMITTEE

The excursions given under the auspices of the California Promotion Committee are made for the purpose of inducing a greater spirit of co-operation and stimulating good sound practical hustling

They are the most unique excursions in the world. None have ever been given just like them anywhere, at any time. The members of these excursions do not go for the purpose of having a junketing trip, even though they do have a good time. They pay their own way. They have nothing to buy and nothing to sell.

A number of excursions have been given under the auspices of the California Promotion Committee.

A notable event will be the trip to Portland, which will be made up of men prominent in development work throughout the whole State of California. A special train of up-to-date equipment, gaily decorated, will leave San Francisco on the evening of June 10th, arriving in Portland on the morning of June 12th, which has been designated by the management of the Lewis and Clark Centennial Exposition as California Promotion Committee Day. The California men will take part in a number of events which have been planned. A feature will be a trip up the Columbia River on a chartered steamboat, in which the visitors will have as their guests officials of the Exposition, the Portland Commercial Club and leading men of Oregon.

The Portland trip will be in the nature of a friendly call of the men of California on the people of their great northern sister State. The whole Pacific Coast is united and California will show her regard for the great northern commonwealth.

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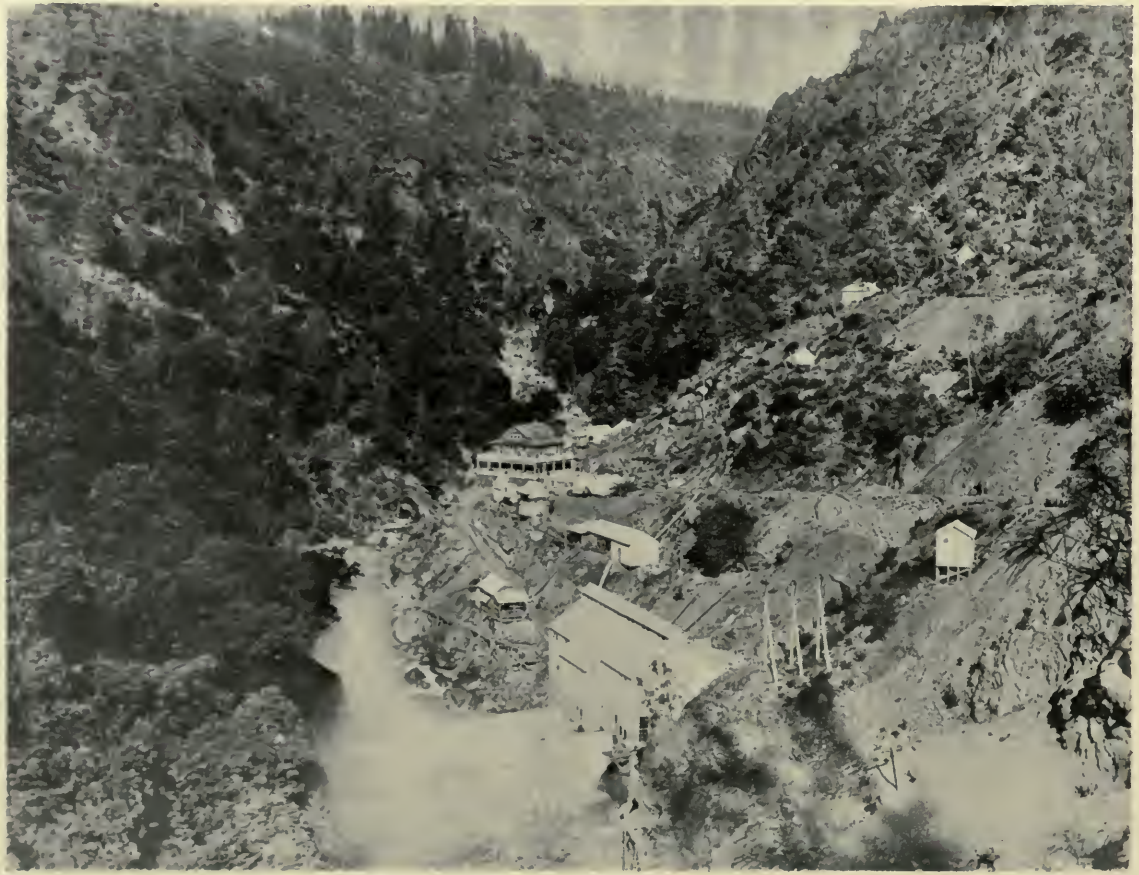

A TYPICAL ELECTRIC POWER PLANT IN CALIFORNIA

The water, conveyed from a great height in pipes, reaches the power plant, where it impinges with tremendous pressure upon the buckets of the water-wheel, which, connecting with dynamo by shaft, causes the latter to revolve with tremendous velocity

What Electrical Energy Means to California

NO factor is destined to play a more important part in the industrial life of California than the development of the vast power available from California's mountain streams.

In the fact that electricity is now extensively used for power, illumination and transportation purposes lies its almost universal usefulness toward the development of the State.

The greatest factories, and the smallest, can be run by electricity; for in its divisibility electric power offers special encouragement to the small manufacturer. He can use as much or as little of the power as he requires. Electrical power from mountain streams is used to run street cars, mines, factories, shipyards, foundries, elevators, machine shops, dredgers, elevators in distant cities and small manufacturing shops where the force employed consists of perhaps only the proprietor and two or three assistants.

Electrical energy will revolutionize transportation methods in this State. Already there are electric railways operating under steam road conditions. They give a more frequent and consequently a better service than the steam roads. Within the next generation California will be gridironed with electric railway lines. No less than five electric railway systems are projected at the present time for the Sacramento Valley alone. Electric railways are of especial advantage in the mountains where they climb the steep grades and round the sharp curves in a manner almost impossible to the steam line.

There is no single factor which has done as much to build up the suburbs of great cities as the electric railway. It settles the country, too, and brings the farmer and his products nearer town. The influence of electric railways in settling up the regions through which they run is shown by the fact that where electric railways have paralleled steam lines not only have the electric lines handled trade to their full capacities, but the business of the steam lines serving the same regions has almost invariably increased.

This statement, of course, relates more particularly to the building up of the more unsettled districts. It would not be true when competition increases, but population and products are stationary.

There are few greater opportunities for investment than in the erection of power plants. All the power companies in California are running with practically their whole output in use, and more in demand. The great number of mountain streams with their perpetual flow of water and the vast storage of water throughout the whole length of the Sierras argues that only a very small fraction of the available power in this State has been developed.

The development of electrical energy from mountain streams does not consume one drop of water, but only the energy furnished by its fall. On issuing from the water wheels the water is re-diverted for the purposes of irrigation.

With electric power at hand close to the abundant sources of raw material electricity will play a great part in manufacturing.

Electrical energy is the most marvelous, convenient, universal, and economic commercial factor in Twentieth Century progress.

And California promises to lead the world in its development.

Harnessing Sierra Streams

IN the vast developments of electrical energy from the fall of Sierra streams the Pacific Coast is solving the problem for cheaper fuel and power. Already this force is the greatest factor in the industrial progress of the Pacific Slope. A tremendous amount of power is generated upon the Coast from comparatively small streams of water flowing from great heights. And it is used for a marvelous variety of purposes.

The strength of mountain cataracts is employed to run street cars, to operate ship yards, flour mills, grain warehouses and elevators, furniture factories, machine shops, pipe and iron foundries, mines, canning factories and floating gold dredges. It illuminates cities, furnishes power for the manufacture of ice and electric cookery and ironing in laundries. The uses to which this energy may be put are innumerable. In the fact that electrical energy is divisible it encourages the small manufacturer, who can purchase as much or as little power as he requires.

In making Nature do this work there has been nothing lost which could commercially be used in other ways. Such use of water for power production does not consume one drop, but only the energy furnished by its fall. The irrigation value of the streams whence this power comes is undiminished. In Kern County, California, even after the water has irrigated the soil, it is pumped up from wells by the very electric power furnished by the water further up in its course. The fact that irrigation and the development of electrical energy go hand in hand is recognized by the United States Government, which contemplates the erection of power plants in connection with the work done under the Reclamation Act.

The development of electrical energy upon the Pacific Coast differs from the hydro-electric development at Niagara, for instance, where a great volume of water is used at a comparatively low pressure. The Sierra streams attain a tremendous pressure because of the great heights from which they fall. The turbines used at Niagara would be torn to pieces under so terrific a pressure. In plants upon the Coast, water issuing from the nozzle may be likened to a bar of steel. It impinges upon the buckets of an impulse wheel instead of a turbine. Instantly its force is imparted to the wheel, the shaft of which connects directly with and operates the dynamo. Thus the electric current is generated.

Such small streams as Mill Creek, ten miles from Redlands, California, would be useless but for the fact of great elevation, which gives a high head in the fall. Here the place where the water enters the pipe is 1960 feet above the nozzle where the water strikes the wheel. This little stream gives a capacity of 5200 horse-power, enough to run a good-sized ocean-going vessel. Striking the buckets of the wheel, the water has a pressure of 850 pounds to the square inch. What this pressure implies is evidenced by the fact that the average locomotive carries steam at a pressure of 190 to 200 pounds to the square inch.

It takes a powerful water wheel to withstand such tremendous pressure. At Butte Creek, California, a jet of water six inches in diameter, issuing from the nozzle at a velocity of 20,000 feet a minute, impinges on the buckets of what is said to be the most powerful single water wheel ever built, causing the latter to travel at the rate of 94 miles a minute. This six-inch stream has a capacity of 12,000 horse-power.

But given your energy already developed, there arises the problem of transmitting it. The first plant in the United States to generate electricity for high tension transmission purposes was erected at Pomona in 1892. This was followed a year later by the opening of a 1500 horse-power plant at Redlands. Then in 1895 the electrical world was surprised by the great

plant at Folsom, California, which at that time transmitted the largest amount of power in the world. The electrically transmitted power was made available for manufacturing purposes by the installation in these and later power plants of a specially designed alternate current motor. At the present time the largest electric power transmission system in the world is that of the California Gas and Electric Corporation, carrying power from Colgate to Oakland and around San Francisco Bay, some 242 miles. The next longest system is that of the Standard Electric Company, transmitting power a distance of 146 miles. And there are many others throughout the State.

No one has ever computed in terms of horse-power the vast amount of electrical power available in Sierra streams, but it must run up into the millions. Altogether probably more than 140,000 horse-power has been harnessed in California.* Almost half as much again is under process of development. About sixty million dollars has been invested in power plants. Rapidly these wild streams are being tamed. Power sites for power houses capable of developing half a million horse-power have been located in California and almost as much in Oregon and Washington. Indeed, the day will soon be at hand when the wheels of industry upon the Pacific Coast will be operated almost wholly by the power of harnessed Sierra streams.

* NOTE—The table given in this issue does not include all the power development because, obviously, all individual developments can not be classified or data obtained regarding them.

A MODERN POWER PLANT IN CALIFORNIA.

THE frontispiece of this issue of FOR CALIFORNIA shows a modern power plant in California. This plant, the de Sabla plant, is typical of up-to-date plants of to-day. In describing the de Sabla plant, one describes the general features of plants elsewhere. Some of the most advanced ideas in hydro-electric power plants practice are embodied in the de Sabla plant. Though completed in October, 1903, many changes and additions have since been made to its machinery.

Water for driving the water wheels here is drawn from Big Butte Creek and conveyed some ten miles in a ditch, whence it is turned into a regulating reservoir. This reservoir is on an elevation some 1530 feet above the power house. Thus, the water on rushing through the 30-inch steel pressure pipes down to the power house, has a tremendous pressure, which is called a "head"—in this case, a "head" of 1530 feet.

A feature of the plant is that it contains one of the most powerful single water wheels ever constructed. The smaller of the photographs reproduced on the frontispiece is an 8000 horse-power hydro-electric generating unit.

It delivers 3-phase, 60-cycle current at a pressure of 2400 volts and is driven at 400 revolutions per minute by the water wheel. This water wheel is capable of delivering 8000 horse-power from the single jet of water, 6 inches in diameter, which issues from the needle regulating deflecting nozzle at a velocity of approximately 20,000 feet per minute, and impinges upon the steel buckets of the water wheel.

An interesting result of early experiments in the transmission of electric power in California was that the first record of the modern electric railway in the Patent Office came from the patent agency of the "Mining and Scientific Press" of San Francisco.

Electric Power for the Farmer

ELECTRIC power, generated from California's mountain streams, offers a most attractive invitation to the man who is engaged or is about to engage in agriculture in California. It invites him to look into the possibilities of having work done cheaply, economically and cleanly. If the agriculturist is located along one of the great electric transmission lines he can, doubtless, arrange to have power delivered to him at a low price. If he is located near a mountain stream it may pay him to have a small electric power plant installed.

Besides bringing the farmer and his products nearer to the railroads by means of electric transportation lines operating under steam road conditions the value of electricity in farming has been demonstrated. It has been found in Kane County, Ill., that electric motors can do farm work at a saving of 50 per cent on the present cost. California farmers in following the example of the Kane County farmers will doubtless have a great advantage over them in that this State possesses better facilities for the generation of electric power.

In view of the benefits to be derived from thus using electricity, it is well to consider what has been done in Kane County. There electric motors have supplanted nearly all human and horse labor on the farms. The saving has been at the rate of $420 out of every $960 formerly expended. The work done by the fifteen horse-power motors installed includes sawing wood, pumping water, separating cream from milk, threshing corn, cutting fodder, plowing the fields, grinding apples, pulping potatoes, loading and unloading wagons and a score of other things ordinarily done by horse or man on the farm. The expense under this new method of farm work is:

Cost for installation of electric motor	$500
Cost of power for one year	30
Cost of repairs for one year	10
Total	$540

The expense for one farmhand and a team of horses required by the old method is:

Hire for one farm hand for one year	$300
His board and lodging	185
Cost of a team of horses, at $125 each	250
Feed for a team of horses, five acres of land production for one year, valued at	200
Cost of shoeing, veterinary, repairs to harness, etc., for one year	25
Total	$960

After the first year, where electric motors are used, this expense will be cut down, as of course, no new motor need be installed.

Besides such use of electricity in the running of machinery upon a farm, it is interesting to note that electric energy may be applied to cultivation itself. One investigator maintains that the influence of sunlight upon growing plants is evidence of an electric phenomenon. Though as yet no apparatus has been devised which makes the application of electricity to young plants practical, the truth of this principle has been borne out by the experiments of Professor Selim Leinstroem. The result of his researches has shown that by electrifying plants at night one may get the same effects as are gotten from sunlight. Furthermore, germination in seeds may be accelerated by electrifying them. It was found that peas,

which ordinarily germinate in four days, after being electrically accelerated, germinated in two and a half days. In the same way, haricot seeds germinated in three days rather than five, and barley in two days rather than five. The methods by which this acceleration has been accomplished have not been thoroughly elucidated; indeed, it is a very complex matter. The action of electricity decomposes certain of the salts contained in the soil, forming others which can be assimilated by the plants more readily. Furthermore, it invigorates the growth by increasing the vitality and bringing about better exchange of gases between the leaves and the atmosphere. Thus, respiration, most necessary to plant health, is promoted. The electricity fixes the carbon in the structure of plants and aids nutrition, with a resultant multiplication of cells. More than this, the circulation of sap is influenced and thus forces the nutritive juices into the capillary vessels in the tissue of the leaf. Plants will be materially strengthened and benefited by the application of electricity when its use in this direction is worked out.

In the meantime, one should not imagine that so employing electricity will allow one to neglect tilling and cultivating the soil. That must always be done, but by the use of hydro-electric energy for motive power, it can be done more easily and cheaply than at present.

California farmers can have all these advantages in using electricity, with the added advantage that here the generation of electricity is cheaper due to natural facilities. In Kane County, electrical energy is generated by dynamos, and hence is transferred from steam power to electric power and back into motive power. In this State we have the incalculable resources of the Sierra streams in which about half a million horse-power has already been located and 150,000 horse-power developed, with 70,000 under process. Hence, in California the only expenses to which the venders of electrical energy are put is in the initial cost of locating the site, putting up the plant and the cost of maintenance. There are now localities in California where horse-power is sold as low as 2 cents per hour.

One enterprising dairyman located near Santa Cruz has realized the profits to be made with a hydro-electric plant. Some years ago he installed one at a heavy cost, and has more than paid all expenses of installation and maintenance. A 1,000,000 gallon reservoir was built for impounding part of the water flow from an adjacent creek. On reaching the dairy the stream attains a head of 216 feet and operates incandescent and arc lights in and about the dairy buildings. There are also motors driving the hay-cutter, pumpkin grinder, cream operator, and machine shops. This extensive plant, a model of its kind, was installed under an indebtedness amounting to $31 per acre, not reckoning interest. This debt has been paid from the profits of the dairy, and the owner thereof now advertises his prosperity and the success of his enterprise by making his trips to town in an automobile.

The benefits to come from the introduction of hydro-electric motive power into farm work are apparent. California farmers, fruit men, and dairymen will profit by it. Surely, no agriculturist who sees the savings in time and money he can make by so doing, will hesitate to install an electric motor upon his farm.

A hand-book on "Poultry Raising" has just been published by the California Promotion Committee. It has been compiled from expert authority and contains much valuable information upon the subject. Thousands of these pamphlets will be sent throughout the State and all over the world. They are neatly gotten up, of convenient size and well printed. The price is five cents.

Electric to Supplant Steam Roads in California

CALIFORNIA, with its invitation to enterprise in hydro-electric motive power, will soon find electric roads generally supplanting the present steam roads. Already, in the cities electric car lines have almost exclusively taken the place of older lines. Suburban and inter-urban traffic is largely cared for by railways run by electricity. Projects are being formed to have third rail or trolley systems carry trains on longer roads now using steam.

The street car railways of San Francisco, Oakland, Alameda, San Jose, Sacramento, Stockton, Los Angeles, Riverside, Redlands, Bakersfield and other cities are all using electric power of which a great portion is obtained from mountain streams. The San Francisco system is the ninth in size in the United States, and receives its current from the California Gas and Electric corporation. This company has for years been furnishing power to the Oakland Traction Company, which operates a suburban railway between Berkeley, Oakland and Alameda. San Jose, the center of the fruitful Santa Clara Valley, is the hub of a large suburban system running to Santa Clara, Alum Rock, Saratoga and Los Gatos, while extensions are projected to Palo Alto, San Mateo, Mount Hamilton, Berryessa, and other points.

The longest interurban electric roads are in the vicinity of Los Angeles. There are five hundred miles of track altogether, controlled by three companies radiating from the city. One of these companies owns three wharves at Redondo, where electric locomotives handle all the freight and lumber which is unloaded from vessels by electric hoists. This company receives its power from a plant on the Kern River, 125 miles distant, showing the practicability of hydro-electric power in generation, transmission, and distribution for operating railways.

Then further north there is the North Shore road, which has been using the third rail with success for about a year and a half. It receives its current from the Bay County system, 180 miles from the Colgate power house, and 250 miles from the De Sabla power house. But of all the longer electric roads in California, most attention has been attracted by the San Francisco, Oakland and San Jose Railway, generally known as the Key Route. The trains on this line are frequently of nine and ten cars. The motive power is received through a diamond shaped trolley, having a play of 18 to 84 inches with contact on a brass roller 30 inches long and five inches in diameter. This trolley was specially designed for the Key Route after a large Eastern manufacturing company had declared that a collector heavy enough to take the required current could not be furnished. This system is notable for its cleanliness, fine rolling stock, and general accommodation.

In the last few days the new Vallejo and Napa Valley Electric Railway has commenced to take a part in the Napa and San Francisco traffic. This reminds one that the Southern Pacific is planning, it is said, to electrify much of its track—the Oakland, Berkeley, and Alameda lines, the steam line to San Jose; and the mountain division between Sacramento and Truckee is to use electric locomotives, taking power from the hydro-electric plant on the Truckee River. Numerous other systems are being projected throughout the whole State.

The introduction of hydro-electricity into portions of the old steam roads is a forerunner of the electrification of all the roads in the State. California is peculiarly favorable to such electrification because of its water powers. Such systems are in line with the development of the Sacramento and San Joaquin Valleys.

Electricity for Irrigation

ELECTRICAL POWER is found to be of advantage in irrigation in California. A singular feature is that often the very water which through its fall furnishes the power is used for irrigation, being diverted from the same stream at a lower level in its course. Irrigation by electrical power is not expensive. For instance, it is said that land at Redding can be irrigated at an expense of $2.54 an acre with water pumped by electrical power from wells or sources 30 feet below the surface. The water distributed over the land will be equivalent to a 24-inch rainfall during 100 days of ten hours each that the pumps are kept running.

W. W. Wheeler, chief engineer of the Northern California Power Company, which corporation stands ready to supply the power needed as far down as Vina on one side and Orland on the other, a condition which no doubt other power companies of the State will gladly comply with, says: "I will give you an illustration of how irrigation with electrically pumped water has paid one man near Redding. M. T. Kite, owning a dairy ranch on the outskirts of Redding, installed a 10 horse-power pumping plant two years ago. He pumped the water, a 23-foot lift, to irrigate 35 acres of land. The installation of his plant cost $800. He estimates that he raised enough extra alfalfa the first year to pay for the expense of the operation of the plant and four-fifths of the original cost, or $800, of the plant. As to the cost of operations, suppose a man has a 100-acre tract that he wishes to irrigate and that his water supply is 30 feet below the surface. It will cost $15 an acre, or $1500, to install the pumping plant. The power company will furnish the power for $2.54 an acre, which is at the rate of $35 a horse-power for ten hours a day for 100 days. With the plant once established, the cost of maintenance would be practically nothing, if proper care be taken. The interest at 6 per cent on the cost of the plant would be $90 a year, or 90 cents an acre for the 100 acres. That would make the total cost of irrigating one acre per annum $3.44 per acre. Allow for incidentals and the allowance of $3.50 per acre would be liberal."

California is the first State to realize the possibilities of hydro-electric motive power. Nowhere else has the energy of falling water been used to such an extent to generate electricity for transmission at high tension, except in New York, which leads by a few per cent, with Illinois 40 per cent behind. The first experiments in hydro-electricity were made at Lauffin, in Germany, in 1891. Within a year there was a plant at Pomona and three years later a big plant was constructed at Folsom. Since then many other plants have been variously located; among them the de Sabla power house, which holds the record for long-distance transmission at 272 miles.

A great deal of the history of early improvements in telephone apparatus originated in San Francisco between 1877 and 1879. Undoubtedly the first serious installation anywhere of a telephone exchange was that operated from the District Telegraph Office on Sansome street. Here also was developed the first automatic ringer and selective signal.

Along with the serious use of the telephone in California originated the long-distance telephone in 1878. It ran from French Corral in Yuba County to the summit of the Sierra Nevadas, some sixty miles in all.

Of all the applications of electricity, one of the handiest has been the principle of the hotel annunciator. The first electric hotel annunciator was installed by W. C. Ralston in the Grand Hotel, San Francisco, in 1868. Just ten years later another important principle of electricity was applied in San Francisco in the construction of the first central station for light and power in the United States.

Cheap Power an Invitation to the Manufacturer

THE success of a manufacturing enterprise is immediately dependent upon three factors—the cheapness and availability of raw materials, power and transportation. Where these three elements of industry are to be easily had at a low cost an industry is bound to succeed from the standpoint of production.

In California the problem of cheap fuel and power is solving itself through the development of petroleum and hydro-electric power. Raw materials are here in abundant quantities. Throughout the entire State, they are attracting manufacturers to make them into finished commodities. At the present time we are exporting many of our raw materials to the East and then reimporting them after they have passed through the factories there. Here we have the raw materials to be manufactured and the demand for the finished article, but not the local factory.

California, next to New York, possesses the greatest quantities of electric power yet produced, and it is the cheapest power; still the resources of the State for the development of this hydro-electricity have not been half realized. Millions of horse-power of electric energy can be developed from Sierra streams. In some places in California electric power has been furnished as low as $50 a year per horse-power in small quantities. It is purchased often for pumping plants at the rate of one cent and three-quarters to a cent and a half per horse-power per hour. Not only is this energy exceedingly cheap, but it is easily available. Being divisible, electric power may be used in as large or as small quantities as the purchaser requires, and a single power plant may furnish motive power to a thousand factories, small and large, within reach of its transmission lines. The number and variety of machines run by electric energy is incredible. It is employed in every phase of industry, from mining to the manufacture of ice.

In fact, transportation itself in California is largely operated by electricity. This third factor of successful manufacturing has opened the interior of the State to the possibilities of industry. An article may be produced in the farthest corner of the State; it can be brought to the market readily. All the time new railways are being opened.

Thus the manufacturer can erect his factory at the spot where the raw materials most abound, can have all the power required brought to him at a very low rate, and finally, will have every facility for distributing his produce to almost any market, though great demand exists in California. With such resources and facilities, California offers an opportunity to manufacturers which no other place can parallel and which will result in developing the State while enriching the producer.

A very complimentary letter has been received from Mr. W. R. Burnam of Norwich, Connecticut, showing how the work of the Promotion Committee is known and appreciated in the East. He writes to acknowledge the receipt of a copy of one of the publications of this Committee—"CALIFORNIA TO-DAY"—"which I have perused with great interest and pleasure. In an address before our Board of Trade entitled 'The Cities of the Pacific Coast,' it served me well in presenting the marvelous growth, material progress, resources and inviting opportunities of California."

After the American District Telegraph system had been installed in San Francisco for some time, it was found that messenger service ate up the profits of the company. To do away with this expense George S. Ladd designed the multiple call district telegraph box, which has since attained great importance. By use of the multiple call box it was possible for L. M. Clement to institute the first police patrol telegraph, which was used in the snowsheds of the Sierra Nevadas.

Electric Power Plants in California

THE following estimates for the income and expense of electric power plants in California are taken from Bulletin 5 of the Department of Commerce and Labor. These figures are the most accurate yet computed. Electrical development has increased since the compilation of these statistics, but they illustrate the proportion between income and expense. The Bulletin covers conditions up to 1903.

There were 3620 central electric stations operating in the United States. Their construction and equipment amounted to $504,740,352. Gross income for the year was reported at $85,700,605; expense at $68,081,375. These stations furnished employment to 23,330 wage-earners, who received $14,983,112 as wages during the year. The power plant equipment consisted of 5930 steam engines, with 1,379,941 indicated horse-power and 1390 water wheels with a stated horse-power of 438,472. The generating plants consisted of 12,484 dynamos of every description, with a stated horse-power of 1,624,980. A noteworthy feature of the development of this industry has been the installation of plants operated under a control of municipalities. There were 815 of these plants in operation. The cost of their construction and equipment was reported at $22,020,473. They gave employment to 2467 wage-earners and $1,422,341 in wages.

While in the totaled figures for the entire United States there are 2805 private stations, as against 815 municipal stations, or about 3 1-2 to 1, in California there are 105 private as against 10 municipal stations, which interpreted means some 10 1-2 to 1. While the first private station constructed in California was built in 1882, it was two years later that the first municipal plant was constructed. While in no single year were there more than three municipal plants built, in 1899 there were fourteen plants put up by private individuals.

The cost of construction and equipment of the 115 California plants was $36,547,474. The gross income for the year 1902 was $5,066,417. The total expense for the same period was $3,918,975. The number of wage-earners employed in these plants was 1009, receiving wages which amounted to $781,154. In California the power plant equipment during 1902 consisted of 150 steam engines, with 64,225 indicated horse-power, and 133 water wheels with a stated horse-power of 72,933. The generating plants consisted of 400 dynamos of all descriptions, having a stated horse-power of 112,354.

ESTIMATE OF THE ELECTRIC POWER IN CALIFORNIA
DEVELOPED BY FALLING WATER

NAME OF COMPANY	No. of Plants	No. of Generators	Rated Capacity of Generators Kilowatts	Total Rated Capacity Kilowatts	Total Normal Rated Horsepower
Northern California Power Co.	2	5	2250	11,250	
California Gas & Electric Corporation.	14	41	all sizes	50,790	
Edison Electric Co				8,800	
Pacific Light & Power Co., San Gabriel				15,150	
Truckee R. G. E. Co	1 running (1 building)	2	750	1,500	
Big Creek Power Co	1	1	150	150	
San Joaquin Electric Co	1	4	340	1,360	
Bakersfield Power Developing Co	1	2	450	900	
Mt. Whitney Power Co	2	3	450	1,350	
Consolidated Mining and Milling Co.	1	1	120	120	
Stanislaus Mining and Milling Co.	1	2	1500	3,000	
Siskiyou Electric Power Co	1	1	500	500	
Yreka Electric Light and Power Co.	1	2	180	360	
				95,230 KW.	127,610 H.P.

This is a very conservative estimate of the electric power developed by falling water in California, based upon the above thirteen companies. At the present time new companies are in course of construction and old ones are installing new units which, it is estimated, will bring this power to an excess of at least 25,000 horse-power over the above figures.

THE BROWN FAMILY IN CALIFORNIA

By JASON BROWN

CHAPTER SIXTEEN

HOW WE FARMERS CLUBBED TOGETHER ON A POWER PROPOSITION.

ONE afternoon in August I went up to our little creamery. You remember, there were eight of us in the venture. I found Robert, black as the ace of spades with grease and dust, tinkering away with the gasoline engine.

"Well, papa, here's a go," he cried. "But it don't go, and I don't know what to do."

"Won't it run, Robert?"

"No, sir; I can't make it go. I guess the carbureter needs fixin'."

If there is anything that exasperates a dairyman it is to have a delay in the working of the cream separator. So I went to work and for two hours tinkered on the old-fashioned engine. At length we heard the rattle of wheels on the road, the gate clicked loudly as it was swung shut, a hearty voice shouted "Whoa, boy," and William Simpson made his genial appearance just as I had concluded to go to Kinney's Corners for a brand new carbureter.

"What we want to do, Jason, is to put in a little power plant, use some of this water that's going to waste down the hill," said Simpson, when I had explained that the present difficulty, which he could see for himself, was but the repetition of a series of minor catastrophes along the same order which had occurred almost from the time we had first established the creamery.

"A power plant?" I asked.

"Yes," said Simpson, "a power plant. I suppose the very words 'power plant' is enough to frighten seven-eighths of the farmers you spring it on. They think it's a new-fashioned notion that involves great expense. In thinking of a power plant every one naturally thinks of the great plants where the force of water is converted into electrical energy and thousands of horse-power is transmitted to distant cities to run street cars and the like."

"Is there enough water?"

"Yes, indeed, there is, Jason," said Simpson, enthusiastically. "We can put in a plant up there in the canyon about six miles. There's a continuous fall of water and we would have a head of 600 feet of water. I've talked with one of the engineers in the city and I believe we can develop something like 400 horse-power at a cost of $6000. Say we get twelve farmers together and have them put in $500 apiece. There's your $6000 right there. That 400 horse-power will be sufficient to light every farm around here, to run the creamery, to bale hay and thresh grain, and do a thousand and one things that electricity will do on the farm."

"But $500 cash is quite a sum of money just at this time. I don't know whether I could raise that amount," I interposed.

"Well, Jason, there are more ways of killing a cat than hanging him," said William Simpson. "For instance, these twelve farmers can only hold two-thirds of the interest and the holders of the remaining third will receive interest on their investment through the sale of electrical energy at Kinneys Corners. Then the entire sum does not have to be all paid down. Suppose we each rake up $250 cash and pay the rest on time. I'm sure such an amount would not be prohibitive as far as you or any of the rest of us are concerned."

Simpson always talks loudly when he is in earnest and as he was waving his arms and explaining the matter in his forceful, genial way, my wife came to the door of the creamery.

"Mercy me," cried Ellen. "Here we have a lot of capitalists. But tell

me all about it, because I was reading where some farmers in Kane County, Illinois, had used electricity with great success, and I know of a dairy in Santa Cruz County where they use electrical power."

"Of course they use electrical energy, Mrs. Brown," said Simpson. "It's the cheapest sort of power and beats a horse all hollow. Why, I know where electrical power is sold for $50 a year per horse-power. Here's a horse that never eats, never sleeps, and works all the time. He works night and day for 365 days in the year for only $50, and better than all, the power of the theoretical horse is more than that of a real horse."

(To be continued.)

ELECTRICAL POWER IN MINING.

THERE is hardly any industry or phase of industry that has not benefited to a greater or less extent by the development of hydro-electric energy. Yet in few industries has this form of energy been applied in a greater number and variety of ways than in mining.

The most good which has come to miners from the use of hydro-electric energy has been in the gold and silver mines of the desert region. Here electricity is of great value for power, since other forms of power are almost entirely unavailable where water is so precious and fuel so costly as in these arid areas. Electrically developed power can readily be conveyed to the mine in the desert to illuminate shafts, tunnels, crosscuts and stopes. With electricity compressed air drills are run, hoists are operated to conduct men and materials to and from lower levels, and fans set going to keep out the impure air. It furnishes pumps to keep the mine dry without the exhaustion of a particle of precious oxygen. Through the agency of this power dynamite blasting has been conducted with less danger than formerly accompanied the explosion. However, blasting with electricity as the igniter of the dynamite is not carried on generally. Another use of hydro-electric energy in mining to be developed in the future is in smelting. To this phase of mining, power electrically produced has scarcely been applied, but when it is ores will undoubtedly be handled more easily and cheaply.

Miners appreciate the value of hydro-electric energy. The famous Yellow Aster Mining Company at Randsburg, California, has gone to great expenditure in demonstrating the use of electricity in working mines and has contracted to buy 3,500 horse-power from a power company which produces 8,000 horse-power to be employed in mining. Another mining company operates its own power plant at Bodie, California—the Standard Consolidated Mining Company. There are many other instances throughout the State which might be cited to show how hydro-electric energy because of its cheapness and availability has supplanted forms of fuel and power formerly used in mining and is making possible where fuel and power are unobtainable.

San Francisco was noted in its early days for the fine theatrical performances it patronized. Few cities paralleled its demand and support of the best plays and the finest actors. It seems appropriate, then, that the most useful accessory of the stage to-day should have emanated from San Francisco. It is now considered impossible almost to produce a successful play without large expenditure in elaborate electric illumination. The California Theater, San Francisco, was the place of the first electrically illuminated theatrical production.

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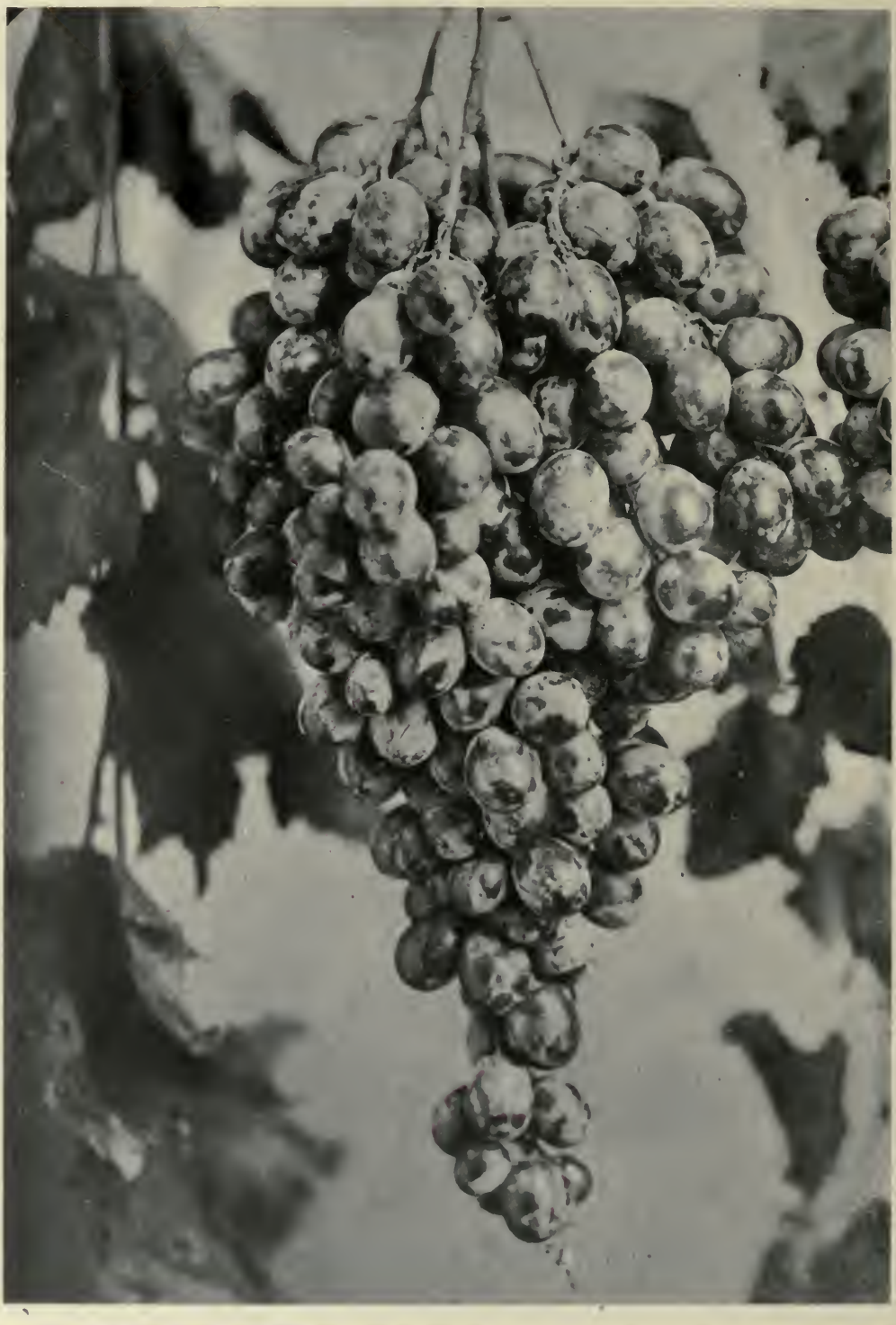

ART REVEALED IN NATURE—A CLUSTER OF CALIFORNIA GRAPES

California Table Grapes

FRANK T. SWETT

FROM time to time for over a hundred years attempts have been made to grow European varieties of grapes east of the Rockies, but without commercial success. There are too many climatic incompatibilities. Cold winters freeze, hot, humid summers breed fungoid diseases of the vine, and copious summer rains split and rot the tender berries.

But in California the fine varieties from Spain, France and Asia Minor find themselves even better off than in their original homes on the shores of the warm Mediterranean. There are dozens of climates west of the Sierras, but the vine adapts itself to all of them. The Sultanina, the beautiful white seedless variety often prosaically called "Thompson's Seedless" shows itself a close observer of the thermometer by ripening in June on the banks of the Colorado River. It ripens a hundred days later, in the cool climate of the shores of San Francisco Bay, at Martinez, and between whiles in a hundred other localities.

There are perhaps ten thousand acres of California soil devoted to table grape growing. Most of the product is shipped to other States, New York and Chicago being the most notable markets, but so thorough is the distribution that no village in the United States goes without. About two million crates, each holding four square baskets of six pounds each are shipped annually. This foots up a little over a half pound of California grapes for each American stomach.

The Flame Tokay, originally from Spain, is the leading variety. Its large clusters of flame red berries whose thick skins and firm pulp enable it to stand long distance shipments, make it a favorite everywhere. Probably two-thirds of the annual shipments are of this fine variety. Later in the season, when the fall rains have put an end to the Tokay shipments, comes the Red Emperor, with a more rain-resistant skin, and large oval berries of a darker shade of red. While hardly as attractive to the palate, its beauty and remarkable keeping qualities assure its sale at fancy prices. Wealthy New Yorkers, who want a fine table decoration frequently pay a dollar a bunch for the finest clusters. A bright California woman, Mrs. Dr. Sherman, of Fresno, has put so much originality, skill and conscience into growing and marketing this variety that her brand of Emperors has become famous and remarkably profitable.

From July to December the trains of refrigerator cars are going Eastward over the Sierras, grape-laden. During that time thousands of men and women find employment in picking and packing. The picking is usually done by men, and though it requires care in the selection of ripe, well-colored clusters and their handling without injury to the bloom, it is the least of the work. Hauled in picking trays to the farmers' packing sheds, the clusters are minutely searched by women and girls armed with scissors, and each bruised, under-sized, unripe, or otherwise defective berry is trimmed out. The bunches are then skilfully laid in the crates, covers nailed on, hauled to the cars, and started on their ten days' journey to Eastern markets.

The leading table grape district is about half way between San Francisco and the Sierras, extending through the rich valley soils of Sacramento and San Joaquin counties.

On rich soil the usual product is from four to eight tons of first-class grapes to the acre. The cost of the best land varies from $80 to $150 an acre. To plant a vineyard, grafted on phylloxera-resistant roots, cultivate it, stake it, and care for it for the four or five years until it comes into bearing costs from $100 to $125 an acre in addition. This is not inclusive of buildings and sheds. The annual care of a bearing vineyard, not including interest or taxes, or picking the crop, varies from $15 to $25 an acre.

Where all conditions are favorable, and skill and conscience is put into the culture and packing, profits of $100 to $200 an acre are sometimes realized.

The shipments from California are increasing annually, and new acreages are being planted. With a very moderate increase in the per capita consumption of grapes there would seem to be room for a considerable expansion of the business. A half-pound per capita seems a ridiculously small allowance for any hungry, fruit-loving American citizen.

RAISINS.

GEO. F. STANIFORD, Secretary Fresno Chamber of Commerce

THIS industry is an important one in the production of California. The acreage of this product is conservatively fixed at 70,000 acres of producing vineyard, yet, during the past five years, many thousands of acres of raisin grapes have been planted, and it is quite safe that California to-day has between seventy-five and eighty thousand acres of raisin producing vines.

The importance of the industry is that, as a separate product, more growers are interested, there being about 3,500 California growers who produce raisins, and the result of about $3,000,000 income from the product every year causes an active circulation of money that is beneficially appreciated by the grower and merchant.

Raisins produce from $50 to $150 per acre, owing to soil. Aside from one or two localities in the West, California is the only raisin producer of the United States. The system and method of marketing the product compares with the imported raisin in packages and quality, and at least 50 per cent of the California product is being placed on the American market in one pound cartoons of seeded raisins—seeded, cleansed and pure of any processing—ready for use in the preparation of puddings, pies, cakes, and for any other use that currants and raisins are required. These goods are sold in the East at 10 to 12½c per pound, and are a household necessity, as there is no labor needed in seeding raisins as in the olden days.

Being a home product the American people should realize that in California, one of their own States, raisins are being produced by a community of farmers who expect and hope that consumers will buy their own home product; superior in quality and modernized by machinery, placing the raisin package in the kitchen of American homes ready for use without even washing.

This product of California is commended to the housewife, therefore use it and encourage home production, particularly when you are securing a superior article for the purpose you intend it. If the consumers of our own country can realize that California is producing from 80,000,000 to 120,000,000 pounds of raisins annually for the American market, why not encourage our own advancement and use California raisins.

California raisin production:

1902	100,000,000	pounds
1903	120,000,000	"
1904	80,000,000	"
1905 estimated	90,000,000	"

These results produce 4,000 to 6,000 ten ton carloads annually.

Drying grapes for raisins forms one of the most prominent features of viticulture as carried on in California. For the last four years average output has been 94,750,000 pounds. Yet, strange to say, this branch of the industry is carried on in California alone. How very expensively it is carried on here the above figures do not show of themselves. But to produce an average crop of raisins, 330,750,000 pounds of grapes are required. Perhaps California is the only State which can afford to divert such a large part of its grape yield to drying for raisins. It certainly pays, however, for the average value of raisins during the last four years has been $4,374,125.

What California Offers to The Viticulturist.

Professor E. H. TWIGHT

THOSE who have not travelled through the vineyards of other lands, who have not studied the methods of cultivating and handling grapes and of wine-making in use in foreign countries, can certainly not appreciate the many advantages that California offers to the practical vineyardist.

If we go through the principal wine-making districts of Europe we find that each locality possesses only a limited number of varieties and produces only a certain local type of wine. Very little, if anything, is done towards trying other varieties or making other types of wine.

Thus we find that in the vineyards of the south of France the Aramon, Carignane, Grenache, Cinsaut, Bouschets, O'Eillade, Mataro, Colombeau, Ugni Blanc, are used to make the ordinary "Vin ordinaire." In the valleys of the southeast the Syrah, Mondeuse, Persan, Hibou, Durif, Pulsard, Trousseau, Govai, Roussanne, Marsanne, give wines of a little better grade. In Burgundy the Gamais, Pinots, Cesar, and in Medoc the Cabernets, Verdot, Cot, Semillion, Sauvignon, furnish the material for the famous "crus" of Bordeaux and Bourgogne. In the Cognac region the Folle-Blanche, is turned into a white wine that will make the "Cognac" brandy.

If we go to Portugal and Spain the Alvarelhao, Bastardo, Mourisco, Donzellinho, Verdelho, Pedro Ximenes, Listan, Almunacar, Ferrar, Bobal, are used to make the renowned brands of these countries. We could go through the vineyards of Italy, Hungary, Germany and again find different varieties different types of wines, each section thinking they have the varieties best adapted to their district.

If we come back to the United States and go through the vineyards of our Eastern States, we see again different varieties, but here it is no more the Vitis Vinifera that is found in its numerous forms as in Europe, but the native grapes have been selected; often, however, these native varieties of Vitis have been crossed with the Vinifera to improve the appearance, flavor or bearing.

Is it only the wish to produce a certain type that makes each locality choose only a few varieties? In the districts where the "Grands Crus" are made, no doubt this is one of the most important factors, but the soil, the climate and the diseases that they may help to implant have generally brought a natural selection that in some instances could not be prevented. In the Eastern States the planting of Vinifera varieties has been repeatedly tried, but they cannot stand the attacks of the fungi disease that thrive on the vine during the moist summer months; the cold winters also may do them some damage. In a similar way since the introduction of some of those diseases (Peronospora, Black Rot, Anthracnose) some vineyard sections of Europe had to replant new varieties more resistant to the attacks of these diseases, and this brought a change in the local type of wine manufactured.

In California we find in our vineyards varieties from all the vineyard districts of the world: France, Italy, Spain, Portugal, Hungary, Germany, even Greece and Persia have furnished their best stocks. All thrive well in their new home. The dry summers of California are not favorable to the spread of the fungi diseases so dangerous in most vine growing countries.

It is evident that varieties of grapes imported from so many different lands cannot do equally well in all locations, but a place for all of them can be found in California. Thus in the cooler districts of the coast, and on the higher locations the varieties from Alsace, Germany, Northern France and Italy find a natural habitat. Further inland in the counties of Santa Clara, Alameda, Contra Costa, Napa, Sonoma, the finest grades of dry wines can be made from the choicest French and Italian varieties.

In the interior valleys of the Sacramento, San Joaquin and tributaries the natural choice would be towards the planting of early table grapes, raisin grapes and those Spanish and Portuguese varieties best suited to the manufacture of sweet wines such as Port, Sherry, Maderas, Moscatels.

It is to be noticed that when the planting of vineyards was in its infancy in California, little was known about the newly imported varieties or about the soil and climate where they were planted, as a result a very arbitrary distribution is found in the older vineyards. This is being remedied in the newer plantations. This indifferent plantation of the early days brought out, however, some valuable information showing that a change in climatic conditions greatly affected the chemical composition* of the grapes so that a fair quality of sweet wine could be made from varieties that had always been transformed into dry wines and vice versa. With the introduction of modern methods of wine-making, the use of cooling devises during fermentation, the use of pure yeast, of more competent wine-makers, many districts of California that to-day manufacture only sweet wines or raisins, will be able to produce some dry wines of very good value for blending and even direct consumption.

In the care of the vineyards we find that California is really leading most countries as their improved implements greatly reduce the cost of cultivation.

Again the concentration of the manufacture of wine in large plants has had the advantage of improving the machinery for the handling of the grapes, pomace and wine, this has brought a cleanliness in the wineries that is seldom found in small plants where most of the work is done by hand or rather crude machinery. Few wineries in the old world can boast of the improved crushers, must pumps, conveyers of grapes and pomace, presses, steam and electric pumps, electric lights that are in daily use in our California wineries.

However, in our methods of fermentation, in our handling of wines after fermentation, we do not find the skill of the old world's "Maitre de Chai." The wine man, the vineyard man, whatever may be their practical knowledge, seldom has the scientific training that we find in the same class of men abroad. The reason is mainly that we have no practical training school of viticulture and wine-making. The College of Agriculture of the University of California, has for years offered courses in those branches, but the location of the college, and no doubt also, the lack of funds, have prevented the giving of practical courses, that are so needed in this line of study, to complete a theoretical training. Here the teaching of these branches has been part of a general agricultural education; in France and Italy, where we find the best schools of viticulture and enology, the general agricultural education is part of the training in "viticulture and enology." With the foundation of a university farm, provided by the last Legislature, we have a bright prospect for the creation of new courses of practical value to the vineyardists and wine-makers. It is to be hoped that special degrees will be offered along those lines so as to encourage graduates with a practical and scientific training such as the colleges of Montpellier, Grignon, Conegliano have sent out all over the world.

Another point on which California enjoys special privileges is in the cheapness of the redwood cooperage. Whereas in other countries they have had to resort to concrete, armed cement, glass, to make fermenting tanks, in California the redwood tank has been found to be just as good as oak to make fermenting tanks, and much cheaper than all oak substitutes. The many advantages set forward by the manufacturers of armed cement and glass tanks, will not always withstand a careful examination, and the redwood tank will hold the lead for a long time to come. The modern methods for the preservation of water will favor the stay of the wooden tank; one of the objections against these being that if they were kept full of water between seasons, the water would spoil and contaminate the tanks, while if they were left empty they would fall to pieces.

Probably one of the greatest boons to the manufacturer of wine is the abundance of water in most localities of this State. This is not only extremely useful for cleaning purposes, for boilers, stills, sprinkling, but with the introduction of modern methods of cooling in fermentation, it will prove invaluable. In Algeria, cooling has been resorted to for many years, and the writer remembers seeing some of the first attmpts that were made there in 1891-92, but the great drawback was the lack of water. Often cistern water has to be used, and in some places the roofs of the buildings not being able to collect enough water during the rainy season to supply the cellar through the year, they had to prepare a cement suface on the ground to collect more water into the cistern. In California all through the interior valleys where cooling is mostly needed we find irrigation canals ready to furnish water to the coolers, and wells can be dug and water pumped at a nominal figure.

With all those points in its favor there can be no doubt as to the great future of the different viticultural industries of California; this future will be still greater when the people will realize what a temperance agent and what a healthful product is the pure wine that our soil produces.

*Vinticultural Report 1896, Agricultural Experiment Station, Berkeley.

Vineyard lands vary in price, but the average cost is probably $200 per acre for land with bearing vines at least four years old. The cultivating of such grape land, including interest on the investment may run from $20 to $35, or even $40 to $75 an acre. Returns from vineyards run an extraordinary gamut, seldom falling below $100 and frequently reaching $500 per acre. Many of these California vineyards are very great in extent, covering 500 acres each. The larger ones contain from 1,000 to 2,500 acres each. That of the late Senator Stanford was over seven miles long, and included nearly 5,000 acres.

California Wines For All The World

ANDREA SBARBORO.

MANY are the productions in which California excels. Its oranges and lemons find favor throughout the United States and other countries. Its fruit of diverse quantities is furnished fresh, dried or in cans, to consumers all over the world. In fact, California seems to grow some of the products of every land, and often times in great abundance. Among all the States of the Union, the grape, both for raisin and wine purposes, is produced only in California to the same perfection as in France, Italy and Spain.

Already California is not only supplying the people of the United States with its delicious wines, but the people of England, Germany, Switzerland, Belgium, and the inhabitants of China, Japan and the Orient are purchasing California wines, for which they pay higher prices and which they prefer to the wines of Europe.

Nothing cheaper can be used in making wine in California than the pure juice of the grape. Though inferior goods are dear at any price, yet the statement is literally true, for the grape in California yields a large tonnage per acre, and on account of California's favorable climate and the modern appliances used, it can be turned into wine at a minimum cost. Whilst the wines of Europe are generally made in small wineries and kept in diminutive casks, California contains the largest wineries in the wide world and the wines are here stored in cooperage of immense size.

While in Europe the special varieties of grapes are only produced in

certain localities, it is surprising that in many parts of California there may be seen growing to perfection in rows, miles and miles in length and side by side, the most diversified assortment of many of the finest varieties of the Old World grapes—grapes of the excellence of generations, from which come the most noted vintages of the earth, and which are in Europe found in regions often far removed. Take, for instance, Sonoma County, a region with which I am particularly familiar, and, therefore, may not inappropriately mention with a view of illustrating California's remarkable diversity as a wine-producing State. I know that others can give the same convincing testimony in regard to other parts of California. Among the undulating hills of Sonoma County, a beautiful region strangely like Italy, may be seen in vast orchards and reaching perfection, the Chianti of Florence, the Barolo and Barbera of Piedmont, Italy; the Reisling and Deidesheimer of the Rhine; the Sauterne, the Cabernet and the Burgundy grape of France, and the grape which produces the delicious port, sherry and Madera type in Spain and Portugal.

These juicy grapes are turned into wines as delicious and with the same bouquet and flavor as those made in Europe.

The large scale on which wine is made in California is one of the reasons for pure wine at a minimum of cost. Rows of hundreds of wine tanks holding from twenty-five thousand to fifty thousand gallons each are not uncommon in California. California boasts the largest wine cistern in the world. This is the famous 500,000 gallon wine tank in Sonoma County. It is built of solid masonry under a hill. After it was first emptied one hundred couples of prominent citizens danced in its capacious interior to the music of a military band. The remarkable celebration of a ball in a wine tank was the most unique demonstration of the great scale on which wine-making is now conducted in California. It is a fact attested by all travelers that in those countries where wine is drunk nationally and wine-drinking prevails among the people there is little or no drunkenness. In Paris, for instance, wine is the workman's liquid meat and bread. In the humblest home in France, where the table is often devoid of a single dish of nourishing food, a liter bottle of excellent red wine can be found. A gentleman who recently returned from Europe commented on the fact that he had seen hundreds of men, women and children sipping their wine and eating their bread on benches in the public parks. "But I saw no one of them intoxicated," he added. "In all the time in Paris I saw only one drunken man, and he had been drinking absynth."

The fact is that wine as used by those who habitually drink it at meals is not an intoxicant.

Before beginning to take wine customarily, one should have some notion how to enjoy it. No wine should be used at breakfast, but might well be had to accompany luncheon and the evening repast. At first, persons unaccustomed to using wine should commence by mixing their claret with water—half and half. The whole pleasure of the beverage is destroyed if one empties one's goblet at a single swallow; instead, it should be sipped. Later, if desirable, the water may be diminished and of claret increased. It is always proper, however, especially for women and children, to drink wine mixed with water.

The pure sweet wines of California, such as port, sherry and angelica, should be used in dainty glasses before and after the repast. Dry white wine is generally used at the commencement of the meal, with oysters and fish. The roasts and entrees are greatly aided when accompanied by claret or burgundy. With the dessert, for one who can afford it, one glass of sparkling muscat or other brands of Cailfornia champagne will be found very pleasant and finish off the meal with delightful satisfaction.

But at present the wine industry in California is not being exercised to its full possibility. The cause is largely that we are not in the habit of drinking wine with the meals. One reason why our wines are not generally used at table by persons living in hotels or accustomed to dine at restaurants

is that while they may have a good meal for twenty-five cents or a better one for fifty cents, if they order a pint bottle of wine they will be charged twenty-five cents extra for ordinary wine and from fifty to seventy-five cents for a pint of extra good wine. Such prices are exorbitant and wholly unreasonable. Every hotel in the United States can afford to serve a pint bottle of sound good wine for fifteen to twenty cents and of choice old vintage of California wine for forty to fifty cents. If sales were made at these prices, they would increase greatly and a rise in profit would certainly result; in fact, the increase would be tenfold.

With such an increase, California wine production would assume its proper place among wine-making countries. As a matter of fact, to make the wine industry of California profitable, the consumption of wine must be materially increased. A few days ago two gentlemen owning large tracts of land called on one of the largest wine grape growers and wine makers of California and asked him his advice as to setting out wine grapes on their land. He answered very pointedly and truthfully in saying:

"When we Americans will become educated to the use of wine at our tables, then you may set out your land in grapes for wine making with assurance of success, but until that happy period arrives, I would advise you to set out other crops, as with the present limited consumption, there are more vineyards producing wine grapes in the State than are required to supply the demand."

But let the market demand increase almost without limit, California's supply can increase just as much. This State has the climate, soil, and facilities for producing just as much wine and of as good quality as that produced in France, and when the demand will warrant it, California will produce one billion gallons of wine, from which it will derive three hundred million dollars per annum, the amount that product now gives to France.

In the last five years the number of acres in California devoted to the sweet wine industry has been increased by upwards of 70,000 acres. In 1901, according to the returns of the County Assessors, there were in California of bearing vines 202,000 acres, and of non-bearing vines 29,000 acres, a total of 231,000 acres. This has been largely increased by heavy planting in the succeeding years so that the bearing acreage of 1905 and 1906 will doubtless reach 250,000 acres.

A large part of this area is devoted to the culture of Muscat grapes—at least 90,000 acres. When raisin prices are good the crop of these vineyards goes into drying trays. On the other hand, when raisin prices fall, a large part of the Muscat yield is carted to the winery presses. Added to this acreage should be the 22,500 acres on which table grapes are raised. Here the growers are accustomed to cull out the finer bearings for shipment, and to send the remainder to the wineries. So the wineries in the sweet wine district must be prepared to receive varying quantities of grapes for crushing, whether these were originally raised to be used upon the table, to be dried into raisins, or to be pressed for wine. One capacious winery, during a period of threatening rains, received and crushed over 1,000 tons of grapes in three days.

Beyond this fluctuating acreage given over to wine grapes, it is expected that within the next few years many thousand acres, not quoted above, will be devoted to this industry.

California is easily the most important factor in viticulture in the United States. The number of grape vines in this State exceeds the total number of vines in the eleven States next most important by 13,474,328 vines. Among the leading grape-producing States California is first and New York a bad second, followed by Ohio, Kansas, Michigan and others less active in this industry. Figures taken from the year book of the Department of Agriculture for 1904 are:

State.	No. of Vines.	State.	No. of Vines.
California	90,686,458	Kansas	5,762,700
New York	29,636,216	Michigan	5,232,450
Ohio	13,772,800	Pennsylvania	4,711,039

How To Market California Wines.

PERCY T. MORGAN

THE science of enlisting the attention of consumers has been but little followed in the marketing of California wines.

It is true that a few individuals owning their own vineyards have from time to time attempted to create a demand for their branded product in original packages direct to the consumer, but for the most part these efforts have been local, or when more extended, have been doomed to failure, partly from lack of continued effort, but principally from the fact that the source of supply in an individual vineyard is too uncertain in quantity and irregular in quality to satisfy any permanent demand.

The larger dealers have confined themselves almost entirely to the distribution of California wines in bulk to distant jobbers, who either bottle them under brands known in their particular localities—perhaps with a domestic and perhaps with a foreign label—or sell them to retailers, who pursue a similar course.

Very few of these secondary distributors have the cellar facilities to properly hold wines in bottles until they attain the ripeness and finish which is essential to giving the satisfaction to consumers attained by foreign wines, which, after being carefully selected and matured, are bottled abroard under some well known label like those of the great bottlers of Bordeaux, Burgundy, Rhine and Moselle wines.

The few California houses which make a specialty of bottling wines are too small in influence and capital to make any great impression on the consuming public in favor of high grade California wines. It is not intended, however, to belittle their efforts, for they are in the right direction, and if their facilities for acquiring good wines and storing them in bottles for the proper length of time should be extended so that a product uniformly of standard grade and even quality is assured, the reputation of California wines cannot fail to be greatly benefited.

Only a very large house, however, with almost unlimited capital and the selection from million of gallons of wine, on the lines of the great Bordeaux houses, can hope successfully and permanently to create a market under a brand which will command the confidence of wine drinkers, whether in Maine or in Florida or in New York or California.

The same methods pursued in Bordeaux and on the Rhine must be followed in California. The fine wines must be bottled in the cellars in which they have matured and immense vaults must be established for the proper ripening of wines in bottles; then, through proper channels, wholesale and retail, these wines must be marketed in the original package, so that the consumer can be assured of a standard of excellence under labels which have everything to lose by any variation in quality or purity. Then so-called wines, which are often blends of manufactured stuff, which never saw the sunny skies of California, but which are injuring our reputation by being masqueraded under the name of California wines, should be driven from the Eastern markets by the strong hand of the law, which if properly directed is especially severe on those who practice the misbranding of articles, and this should be further strengthened by the passage in Congress of a National Pure Wine Law which would render dangerous interstate commerce in frauds.

Another reason why California wines are not more highly regarded in the East by connoisseurs is that, however carefully they may be aged and tended in bulk in California, all responsibility to their originators practically cease when they are loaded aboard the cars by the great California wine houses.

How they are handled thereafter and by whom, whether they are put out pure or adulterated and what prices are asked for them from consumers,

are matters of complete ignorance to the original handler. It is a common expression for an Easterner visiting California to exclaim, "why, we are never able in the East to obtain California wines like those even offered, included with a meal, at the restaurants, let alone those which are freely met with bottled under brands locally well known in California."

This condition of affairs must be altered before California wines in the great consuming markets of the East can become fashionable at the best tables and take the position their initial quality deserves alongside the best foreign vintages.

Steps by influential and responsible concerns are now being taken in this direction and within a year or two earnest and concerted efforts will undoubtedly be made to place California bottled wines in their true light before the American people.

The marketing of bulk wines for many years continues to be the most important branch of the California wine business, for the population which relies upon wine for a beverage must continue to receive it through the hands of convenient local distributing houses at a price which will encourage its greater consumption just as in Europe the local market is vastly more important to the industry than the smaller quantity of selected vintage which is consumed by the wealthy.

But attention must also be paid to that large class which is patriotic enough to prefer domestic wine and willing to pay an adequate price when, in comparison to foreign wines, its quality has been duly demonstrated.

California Wines Under Their Own Flag.

CHARLES BUNDSCHU

THE great difficulty of creating for the wines of the Golden State an acknowledged recognition of superiority may be attributed to a considerable extent to the fact that they are not always traceable as sailing under their own flag. We know, and the statistics can easily verify the fact, that millions of gallons are shipped annually to the great trade centers of this continent, and yet comparatively speaking, we don't meet California wines in our travels as frequently as the volume of our shipments would warrant. There still exists an indefinable prejudice against the use of wine at a dinner table in the United States, and if wine is used at all, preference is given to European brands. This naturally stimulates the desire on the part of many of the distributers of California wines to utilize our selected vintages to represent foreign wines, thereby netting considerably higher financial returns than the truthful and honest denomination of their origin could possibly accomplish. Many so-called connoisseurs drink only the label—at least their verdict is seriously influenced by high-sounding outward indications. They revel over a bottle of Chateau Margue, Sauterne or Johannisberg, and would often sadly fall by the wayside if they knew the true and unsophisticated reality in connection with the product. As long as the wine is good, pure and healthful, no harm is done, except to the purse of the would-be connoisseur, and he generally can afford to pay for his ignorance. But on the other hand in all these instances the merits of the well selected superior California product fails to obtain the credit to which it would be fully entitled, while the cheap every day—hand-to-mouth—minimum wines (forming about eighty per cent of our shipments) are best known on account of their cheapness, and the general estimation in which they are held goes hand in hand with their monetary valuation.

The main difficulty lies in the intricate hardship connected with the

introduction of our vintage wines in bottles direct to the consumer. No distributer in the trade centers offers an inducement to the conscientious vineyard proprietor in California to handle his brand of wine in glass. The glory of French wine, the illustrious fame of the vintages of the Rhine and Moselle, the renown of Tokay and Lacrimae Christi, all have been originally built up by the most careful selection of wines in bottles. Every bottle acts as an emissary and as the most powerful agent to demonstrate quality and purity and every true and honest proprietory label on the bottle if judiciously applied, adds to the propaganda and promulgation of our California vintages. As matters stand now, principally the bulk goods, and these not always thoughtfully selected, find purchasers under rather more than competitive prices. Greater attention must be paid to the distribution of our home labeled bottled goods and even if it involves a great sacrifice, it will have to be done. Brands must be established on a more extended scale, and the policy that has heretofore been the policy of only a few of the leading vineyardists, must become prevalent in California as in other wine-producing countries. We must strive to bring our very best wines at reasonable prices to the great centers of consumption in bottles—in fact we must utilize our superior vintages as advertising agents to proclaim that there is as much distinction in California wines as there is in any other product; some are not so good, and they go for what they are; some are better and they are recognized; but the best must stand as a type, in the same sense as the best American woman represents the real type of American womanhood.

THE BROWN FAMILY IN CALIFORNIA

By JASON BROWN

CHAPTER SEVENTEEN

IN WHICH WILLIAM SIMPSON TELLS OF GRAPE GROWING AND OTHER THINGS.

"I SUPPOSE that two acres of red soil on the hillside isn't good for much and I had better leave it in pasture. Indeed, it does not make any too good pasture," I said to Simpson one Sunday afternoon, as we were walking over our California farm.

"Indeed, Jason, you were never more mistaken in your life," replied Simpson, as he caught a soft, red-looking bit of rock from the ground and crumpled it between his thumb and forefinger.

"See how that stuff powders up. That's granite, disintegrated granite, decayed granite. Its loose, porous, full of iron and other minerals. It makes the best sort of fruit land. Deciduous fruits, like Bartlett pears, for instance, grow on it to beat the band. It's great land for grapes, and the finest flaming Tokay grapes I ever saw were grown on this very sort of soil. They are a splendid table grape when grown right; they have a magnificant appearance and exquisite flavor; they attain large size and command a good market price."

Here Ethel, who is always observant, asked Simpson a question which brought out some important facts in grape growing.

"I notice you say that the iron in the soil is good for grapes, Mr. Simpson. Does the plant absorb the iron?"

"Now, Miss Ethel, I'm glad you asked that question," replied Simpson, nodding approvingly at our pretty daughter.

"Certain plants contain minerals in great quantities. When the soil contains these minerals the plant seems to thrive to an extent impossible without them. Dr. Gabriel Viaud, a French scientist, who has been making experiments to secure the absorption of useful medicinal substances by food plants, says that much may be accomplished by watering the soil with solutions of phosphorus, sulphur, potash, arsenic, and other minerals, which,

as trials have shown, are readily absorbed by the tissues of plants. An illustration of this fact is afforded by the ease with which certain kinds of flowers may be changed in color from pink to blue or from white to blue by sprinkling them with a solution of iron. The same effect, indeed, is produced when they are grown in a soil rich in iron."

"Why, I had no idea that plants assimilated minerals so readily," said my wife.

"Yes, indeed, they do, ma'aam," replied Simpson, "and if folks only knew it instead of taking pills for various ailments they could assist in giving the body the proper nutrition in the most direct and assimable form by eating vegetables and fruits containing the desired minerals. I think Dr. Viaud's conclusion that watering the soil with a solution containing minerals, feeds those minerals, in a way, to the plant only goes to show that where the earth contains these minerals they are readily absorbed by the plant."

"Goodness me, what a study they make of plant growing now-a-days? It has come to be quite a science," said Mrs. Simpson.

"That's so. It is a science," replied Simpson. "Agriculture calls for the same scientific thought that any business or profession does. And when a man is up-to-date and makes the study of plants his hobby, his results are correspondingly great."

"Do you recall any California men who have achieved success through the application of scientific principles to agriculture?" I asked.

"I certainly do," said Simpson. "Take the man who has achieved the greatest results in fig growing, and who has made money by it. He spent years establishing the caprification of the Smyrna fig. Take the man who has made the greatest success in olive growing; he is a scientist in his line. Take the leading grape-growers; they are familiar with the studies of generations of men in Europe and other countries. The same may be said of almost all other lines of agriculture. The men who have coupled energy and practical application with scientific principles are the men who are foremost."

"Then you do not think that to raise a great quantity of produce means success?" I asked.

"No, indeed, it doesn't," replied Simpson. "It may mean failure. Success means doing some one thing a little better than the other man. The man who raises better table grapes than anybody else, or better olives, better figs, better oranges, is sure to succeed. If his goods are marked by their excellence he will command a ready market at a high price. I have in mind a man who has made a notable success in orange growing. He is an expert, a scientist. His fruit brings a high price. He goes to Europe almost every year while some of his less fortunate neighbors are wondering whether they will come out even.

"What we have we should try to have the best of its kind, and we should be content with nothing less," continued Simpson. "Mr. Burbank is showing the world what can be done, and though none of us can ever hope to duplicate his work, we can all profit by his example."

"Do you think a man like my Jason, who has a small diversified farm can use these scientific principles to advantage?" asked my wife.

"Of course I do, ma'am," said Simpson. "We were talking about this red earth here and how good it is for Flaming tokay grapes. Now, if Jason can raise the finest table grapes in the market, he can get almost fabulous prices for them because the very best of anything costs money."

"And all this means that it pays to raise a good article," I said.

"Exactly," replied Simpson. "Now I guess my team is getting restless, and if you folks are ready we will all drive over to the Estudillo rancho for dinner."

And so we all had a mighty good dinner at Neighbor Simpson's that evening.

(To be continued.)

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AND OTHER ARTICLES

THE CALIFORNIA PROMOTION COMMITTEE

SAN FRANCISCO

FOR CALIFORNIA.

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A MONTHLY PUBLICATION

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IRON CANYON, SACRAMENTO RIVER, ABOVE RED BLUFF, CALIFORNIA

OPENING THE FLOOD-GATES OF THE TRUCKEE CARSON PROJECT, JUNE 17TH, 1905

THE PICTURE ABOVE—IRON CANYON SHOWS ONE OF THE PROPOSED SEVEN HUGE UNITS OF THE SACRAMENTO VALLEY IRRIGATION PROJECT. THIS IS THE LARGEST AND MOST COMPREHENSIVE IRRIGATION PROJECT IN THE UNITED STATES.

THE LOWER PICTURE—IMPREGNABLE CONCRETE HEADGATES ON THE TRUCKEE-CARSON PROJECT, NEVADA, SHOWING THE FINISHED CHARACTER OF THE WORK UNDER THE NATIONAL RECLAMATION ACT.

What the National Reclamation Act Is

THE National Reclamation Act, sometimes called the National Irrigation Law, became a law on June 17th, 1902. (32 Stat. 388).

This act provides that all moneys received from the sale of public lands in Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Utah, Washington and Wyoming shall be set aside as a special fund in the United States Treasury to be known as the "Reclamation Fund." The Reclamation Fund excepts the five per cent of the proceeds set aside for educational and other purposes.

At the present time the Reclamation Fund amounts to about $28,000,000 and is increasing at the rate of $4,000,000 a year.

Under the Reclamation Act the Fund is "to be used in the examination and survey for and the construction and maintenance of irrigation works for the storage, diversion and development of waters for the reclamation of arid and semi-arid lands" in the sixteen States and Territories.

The purpose of the Government under the National Reclamation Act is to make homes for homeseekers.

After the irrigation works are constructed, the sums expended are to be returned to the Government in ten annual installments. Thus the Reclamation Fund is self-continuing, and after irrigation works have been constructed the money can be used for further development, as it is constantly returned to the Reclamation Fund by the settlers.

The public lands affected by the Reclamation Act are subject to entry under the provisions of the homestead laws in tracts of not less than 40 nor more than 160 acres. No right to the use of water for land in private ownership shall be sold for a tract exceeding 160 acres to any one land owner.

The land owner must be an actual bona fide resident on the land and the settler on the public domain must be a bona fide settler.

Any one desiring further information should write to the General Land Office, Department of the Interior, Washington, D. C., for the circular from the General Land Office issued January 25, 1904. This circular shows the manner of proceeding to obtain title to public lands under the homestead, desert land and other laws. In this volume the National Reclamation Act is printed in full.

EVERY American will be in accord with the great work which the Federal Government is doing under the National Reclamation Act.

Every Californian it is believed and everyone who is interested in California will find much of value in this number of FOR CALIFORNIA. This number is called the "Reclamation Projects Number" because it deals with the projects which the Government has under consideration, or under way, in California under the National Reclamation Act.

The first article in this number, "Opportunities for Government Irrigation in California as I Saw Them," comes from Hon. Frank W. Mondell of Wyoming, Chairman of the House Commitee on Irrigation. Three splendid articles tell of three national projects in California. Professor Fortier tells of the work of the experiment stations, and Mr. Newell suggests how all may co-operate with the government movement.

This month's issue also contains an article by Mr. John W. Ferris, C. E., dealing with the improvement of the Sacramento River and the reclamation of one million acres of swamp land.

NOTE—Every article in the Reclamation Projects Number of For California was written expressly for this issue.

Opportunities For Government Irrigation in California As I Saw Them.

HON. FRANK W. MONDELL, of Wyoming, Chairman of the National House Committee on Irrigation

OUR Congressional Irrigation Party, consisting of Members of the House and Senate Committees on Irrigation of Arid Lands, spent a most enjoyable, interesting, and, from the standpoint of increased knowledge of irrigation conditions, profitable week in California in June of this year.

The Southern Pacific Railroad gave us splendid special train service; its officials rendered most thoughtful and valuable assistance in planning and arranging our itinerary; and the business organizations and people of every locality visited left nothing undone to make our sojourn delightful and to afford us every possible facility for seeing the results of irrigation development. In addition to this, the officers of the National Reclamation Service, who are charged with the development of irrigation projects in California gave us the benefit of their wide and thorough information and knowledge of opportunities and conditions throughout the State.

It is from the standpoint of the knowledge acquired on the trip in question, as well as on the occasion of former visits to California, and from a somewhat careful study of the past history and present prospects of irrigation development in California as effected by the laws, customs and decisions relating thereto, that I respond to the invitation to write briefly on "The Opportunities for Government Irrigation in California as I Saw Them."

A stranger to the irrigation development of California on his first visit to the State is invariably greatly impressed with the remarkable character and extent of such development and the marvellously successful results which have been obtained thereby; but if he be interested in the subject of irrigation and take the trouble to investigate conditions, he will soon find himself even more impressed with the magnificent opportunities for further irrigation development, the vast extent of fertile lands and abundance of water supply still remaining to be utilized.

Nowhere in the arid region are to be found streams of such splendid volume with easily reclaimable adjacent areas of such great extent, favorable topography, and great fertility as are to be found in California to-day. In this condition of affairs, it requires no argument to demonstrate the possibility of enormous development by the construction of adequate irrigation works. With numerous and alluring opportunities stretching from the head of the Sacramento Valley to the southern line of the State, it would be impossible in the space of a brief article to specify and enumerate the particular advantages of each available project. Suffice it to say that with the people of the regions to be benefitted in active and complete harmony with the contemplated development; with questions of water-rights and available water supply and division of the land into small holdings, as contemplated by the National Reclamation Law, settled, there is abundant opportunity in California to expend profitably and to the vast advantage of the State and country in the construction of works under the National Irrigation Act a sum larger than the $28,000,000 now available for the entire country.

Of course no such sum as this can be used in California by the National Government, at least for many years to come; but the Reclamation Service stands ready to make a goodly beginning at an early date. Upon the officers of that Service rests the responsibility of determining, after taking all features and factors of each project into consideration, where the first expenditure may most profitably be made.

In this connection it is of very great importance that the people of the State at large as well as of the various localities directly interested should study carefully and give their best thought to overcoming those difficulties which must of necessity under present conditions hamper and somewhat delay irrigation development in the State, whether by the National Government or by private enterprise.

One of the obstacles to early and complete irrigation development in some localities in the State will no doubt sound strange to the average Californian: That is the absence of a united public opinion favorable to complete irrigation development and appreciative of its very great benefits. That such a condition should exist in any arid or semi-humid portion of a State which has made more splendid progress and achieved greater triumphs under irrigation than possibly any region in the world seems passing strange; but in some important localities it is a factor to be reckoned with.

Another feature of the situation in some localities not favorable to early and complete irrigation development is the existence of vast tracts of land in a single great corporate or individual ownership, a condition which must be changed before irrigation can be accomplished under the Reclamation Law. This division of large estates seems somewhat difficult of accomplishment in some localities by reason of the failure to appreciate fully the great increase in values which irrigation will bring.

But of vastly greater importance to the future development of the State by irrigation and to the peace and prosperity of the lands already under irrigation than are the features of the situation above referred to is the question of the equitable, speedy, and final settlement of the question of rights to water already acquired and the adoption of some method and procedure for the just, orderly and economical acquirement of future rights. From an irrigation standpoint this is the paramount question in California to-day, and the extension of the irrigated area of the State whether under government auspices or private enterprise must of necessity be at least retarded if not in many instances prohibited by conditions under which it is impossible to determine absolutely in advance of expensive litigation the exact nature or extent of rights now established and therefore the amount of water available for further extension of the irrigated area. The friends of California and her future irrigation development cannot afford to ignore or attempt to minimize the difficulties that the present uncertainty as to the extent or volume of acquired rights, and therefore as to the amount of water in streams still available for irrigation in certain districts, place in the path of future development.

Each of the arid States presents some special favorable conditions as each has its peculiar difficulties in the further considerable extension of her irrigated areas. Perhaps none of the States and Territories to which the Reclamation Act applies presents on the whole and taking into consideration every factor such magnificent opportunities for extensive development as does California; and with the removal of the obstacles to which I have referred California will have a splendid future development under irrigation both through the agency of the National Government and by private enterprise.

Only those who have seen the marvelous changes wrought in the West through irrigation can appreciate the full significance of the National Reclamation Act. In building great storage reservoirs and diversion dams; in constructing huge canals, laterals and headgates, the National Government purposes to make homes for homeseekers through the bringing of water to the dry but fertile soil.

It is hoped that every newspaper, every organization and every citizen in California will co-operate with the Government movement for National irrigation. Publicity of the great work the Government is doing in the West to make more room for the homesteader will secure the desired result.

How The People Can Co-operate With the Government

F. H. NEWELL, Esq., Chief of the United States Reclamation Service

THE National Reclamation Act, approved on June 17, 1902, has for its object not merely the irrigation of arid lands but also the subdivision of the lands into tracts sufficient for the support of a family and not exceeding 160 acres. The execution of this Act would be a comparatively simple matter if all of the lands to be benefitted were in public ownership. Many of the best lands have, however, already passed out of the hands of the Government and are now held in large tracts by individuals and corporations.

Some of the present owners of these lands are desirous of having these lands reclaimed at public expense, the cost to be repaid in the future without profit or interest, but at the same time they are equally desirous of keeping the lands for future rise in value and are not willing to make concessions which may reduce the future gains. Many of them are willing to promise to subdivide the lands and put them on the market, but when called upon to execute a formal contract which will insure this sub-division within reasonable time they are apt to bring up various objections and to evade committing themselves. Great patience and firmness is therefore required on the part of the Government agents.

On the one hand is the popular clamor, stimulated by interested parties, to hurry the spending of the money of the Government in building the works, on the other hand are the obvious requirements of the law and the necessity of securing binding contracts or agreements by which the object of the law will be fulfilled.

In answer to the question, which has been asked as to how the people can co-operate with the Government in this matter, the first and fundamental proposition is for the people to understand the object of the law and to bring to the officers of the Reclamation Service suitable guarantees that the law will be fulfilled on their part. No Government money is to be spent in construction until definite and binding agreements have been made which will secure obedience to the law. Criticism for delay or abuse for not proceeding more rapidly will not suffice in the place of the definite and binding contracts on the part of the large land owners.

The owners of large tracts of land, as well as the small land owners should get together and request the Secretary of the Interior, by petition or otherwise, to consider the reclamation of certain areas pointing out as fully as practicable the source of water supply and the lands to be irrigated and stating that they are prepared to give full assurance that these lands will be sub-divided and placed in the hands of actual settlers by the time that the irrigation works are completed and the water is ready for delivery to the lands. If this is done the subsequent work of the engineers is greatly facilitated and the matter becomes largely one of feasibility of construction.

An equally important detail to be settled by the present land owners is that pertaining to existing water rights. All of these must be fully adjusted so that the Reclamation Service will not be called upon to waste time and money in the vain attempt to settle existing quarrels. It frequently happens that when all of the valid claims are finally adjusted these average more than the entire flow of the river or even more than can be provided by complete storage. It is, therefore, impossible for the Government to secure any water; time spent in engineering examinations would be wasted.

These matters of water rights are controlled by State Laws and can be settled only by the people themselves. Experience has shown that it is inadvisable for the officers of the Reclamation Service to attempt to interfere in such matters as, like most neighborhood quarrels, whenever a third party intervenes all the contending forces unite against him.

WORK OF OFFICE OF EXPERIMENT STATIONS FOR IRRIGATION.

The Reclamation Act was passed with a view of reclaiming public lands and incidentally some private lands. It is applicable in part only to the situation where private lands predominate, and to be effective in such cases must be supplemental by voluntary action on the part of the present land owners and by agreements or decisions covering the points above named. There is no intent or desire on the part of the Reclamation Service to interfere with State or Court control of the waters and even the appearance of doing so is to be avoided. The people of California have in their own hands the initiative as regards any reclamation of private lands. When they have taken this initiative the Reclamation Service will be glad to assist, upon suitable authority given by the Secretary of the Interior.

To repeat the essentials of co-operation by the people of California; they must, first, show their wish for Government construction; second, their willingness to conform to the letter and spirit of the law regarding subdivision of lands; and, third, settle under State laws all questions as to the rights to the waters.

THE WORK OF THE OFFICE OF EXPERIMENT STATIONS FOR IRRIGATION IN CALIFORNIA

By Prof. SAMUEL FORTIER, Irrigation Engineer, in charge of Pacific District

THERE are now 35,000 irrigated farms in California. Every day the owners of these farms ply their calling they are confronted with practical problems of irrigation practice, a better knowledge of which would lessen their expenses and increase their profits. The Office of Experiment Stations of the United States Department of Agriculture, through its division of irrigation and drainage investigations, is endeavoring to help the farmers of the State solve these problems rightly.

When a farm is first being prepared for irrigation, its owner, if he be wise, will desire to adopt that method of applying water which the experience of the most successful has already shown to be best suited to his conditions. As a part of the work of the Office of Experiment Stations in California, the experience of the best irrigators in preparing land and applying water, not only in California but also in the other western States, has been ascertained and presented in convenient form (Bulletin 145, Office of Experiment Stations.) This bulletin, with its descriptions and illustrations, furnishes a guide not only for the beginner, but also for the experienced irrigator who is willing to learn from the successes or failures of others.

As soon as a farmer opens his lateral headgate he is confronted with the problem of the duty of water. He needs to know not only how much water to apply to supply the needs of his crops, but also how much to allow for the losses by percolation and evaporation. Through the use of field plats and specially designed galvanized iron tanks, in both of which crops are being grown and the amounts of water applied are being carefully measured, the Office of Experiment Stations is endeavoring to learn the essential facts regarding this problem.

Something over 200,000 acres is now irrigated in California by pumping. The use of pumping plants involves not only a large outlay for purchase and installation, but also a constant outlay for operation and maintenance. It also involves a knowledge of machinery not usually possessed by farmers. For each class of work there is generally a particular type of pumping plant that will give the best results, and proper economy requires that that particular type and not some other should be used. For the purpose of ascertaining from actual field conditions what plants are best

for the different classes of irrigation, and how the different plants should be installed and operated to work to the best advantage, the Office of Experiment Stations has been testing a large number of irrigation pumps throughout the State. The results of some of these tests are now in press and those from the remainder will be published during the coming year.

Important in irrigation as are the subjects already mentioned—proper methods of preparing land for irrigation and of applying water, the duty of water and evaporation losses, and pumping for irrigation—there are other subjects so pressing that the Office of Experiment Stations has not been able to let them pass unheeded. The problems of two of the leading irrigation districts of the State have shown themselves worthy of attention and a report dealing with them is now in press. The rise of ground water in irrigated sections and the resulting damage and necessity for drainage are being watched in several parts of the State. The feasibility of irrigating grain in the San Joaquin Valley and the best methods of applying water to it are under careful study. A bulletin is being prepared designed to show the economy of permanent over temporary structures on California canals and ditches. The relative economy of deep and shallow furrows in applying water to orchards, particularly to the citrus orchards of southern California, is under careful consideration, some of the principal field work of the past season having been carried on in connection with this subject in the district around Riverside.

In brief, the irrigation work of the Office of Experiment Stations in California, as well as in the other western States, is the work of the irrigator. His problems are its problems. What he learns the Office of Experiment Stations is seeking to learn, and wherever he needs help the Office of Experiment Stations is seeking to furnish it.

THE KLAMATH RECLAMATION PROJECT

H. L. HOLGATE, Esq., Attorney for Klamath Project

IN the rock of rough marble the sculptor saw an angel. His practised hand chiseled away the imprisoning stone, revealing to the world a figure of beauty. With an equally prescient eye the United States Reclamation Service sees in the Klamath Plateau of Southern Oregon and Northern California, a land of thousands of prosperous farm homes, and with equal skill the engineers of the service will reveal the agricultural possibilities of this undeveloped region.

Under the Klamath Project, the official name of this irrigation system to be constructed by the Government, lie 250,000 acres of irrigable land. About 145,000 acres are in private ownership and 105,000 acres are government lands. The public lands will be subdivided into tracts averaging 80 acres in extent, and under the law the private lands must be subdivided into farms not exceeding 160 acres under one ownership. The average size of all the farms will probably be less than 100 acres and the total number of farms will be something more than 2,500. These farms and the immense timber resources of the country will easily support a population of 50,000 people.

The Engineers of the Service are not here confronted with difficult engineering problems. The water supply is abundant and nature has provided the necessary reservoirs. The larger area of the irrigable land, about 190,000 acres, will be supplied with water drawn from Upper Klamath Lake situated in Klamath County, Oregon. This lake has an area of 60,000 acres, an average depth of about eight feet and an elevation of 4142 feet. The lake receives the drainage of an immense watershed. Its

only outlet, over a rim-rock, is Link River, a stream which has a length of about one mile and a fall in that distance of 56 feet, emptying into Lower Klamath Lake. This latter lake extends from Klamath Falls, Oregon to Laird, Siskiyou County, California, a distance of 25 miles. The depth of water varies from one to twelve feet and a heavy growth of tules marks the greater area. The lake has an elevation of 4086 feet and an area of about 80,000 acres. Except for a large drainage channel, which will probably be navigable, Lower Klamath Lake will be reclaimed by drainage and evaporation and subsequent irrigation. Its outlet at Keno into the Klamath River will be deepened twelve feet by a rock cut.

The second reservoir is Clear Lake, in Modoc County, California, where a restraining dam must be constructed. The outlet of the lake is Lost River which flows north through rich valley lands in Oregon and then turns south, emptying after a course of 60 miles into Tule Lake, situated partly in Oregon but chiefly in California. Clear Lake has an elevation of 4533 feet. Its waters will be utilized in irrigating about 60,000 acres of land in Langells, Yonna and Poe Valleys. Lost River, upon leaving Poe Valley, debouches upon the Klamath Plateau and from this point its waters will be diverted, through a drainage channel, into Klamath River, thus depriving Tule Lake of its source of supply. It is expected that by evaporation 50,000 acres now covered by the waters of Tule Lake, which has no surface outlet, will be reclaimed.

The estimated cost of the Reclamation System is $4,500,000 or an average cost of $18 per acre, the smallest cost per acre of any project whose construction the Government has yet undertaken. The Government is ready to advertise for bids for the initial work and construction will probably begin this year.

There will be no public land under the project subject to entry for several years. The Government holdings are practically confined to the water-covered lake lands and will not be thrown open to entry until fully reclaimed and ready for cultivation. As the Government will not sell a water right for more than 160 acres to any one person, a considerable acreage of the private holdings is upon the market at prices ranging from $10 to $50 per acre, depending upon the amount of improvements, state of cultivation, quality of soil and nearness to market. For particular information relative to land the officials of the Reclamation Service refer inquirers to the Secretary of the Klamath Water Users' Association, Klamath Falls, Oregon.

The growing season, owing to the high altitude and consequent frost, is comparatively short, but the soil is very fertile and the grasses, grains, vegetables and the hardier fruits are successfully grown. Great areas of mountain and hill country stretch away in every direction, affording excellent outrange, and even under present conditions some 25,000 head of beef cattle are driven to market annually. Klamath County sells each year to the United States army many horses which bring from $125 to $150 each. Beets, grown experimentally, show a high percentage of sugar. Tests show the tule soil to be extremely rich and especially adapted to the growing of celery, asparagus, potatoes, and fodder for dairy animals.

The timber resources of the Klamath region are enormous. The estimates of experts as to the pine and red fir forests tributary to Upper Klamath Lake, range from 10 billion to 15 billion feet.

The climate is healthful and attractive. Many delightful nooks and corners, forest-covered mountains, expansive lakes and crystalline, trout stocked streams tempt the city folk who take summer outings; and not the least important is the beautiful and mysterious Crater Lake—one of the wonders of the West. The shot-gun devotee finds nowhere such duck, geese and swan shooting as these mountain lakes afford.

The Klamath country is one of vast undeveloped resources of vast possibilities. With the construction of the government irrigation system and the building of railroads to carry the products to market, both achievements of the immediate future, golden opportunities for the farmer, the stock-man, the manufacturer and the business man will present themselves.

The Yuma Reclamation Project

D. W. MURPHY, Esq., Acting Supervising Engineer, Yuma Project

THE first work of actual construction in California under the terms of the National Reclamation Act of 1902 has been begun on the Yuma Project on the Lower Colorado River.

The lands which it is proposed to irrigate under this project include the valley lands of the Colorado and Gila Rivers in the vicinity of Yuma, and are situated in both California and Arizona. The total area of valley lands which will be brought under irrigation is about 90,000 acres, of which 17,000 acres are in California, and include the Yuma Indian Reservation.

Preliminary investigations on this project were begun under the direction of J. B. Lippincott, Supervising Engineer, during the winter of 1903-4. These investigations consisted of making topographic surveys of the irrigable lands for the purpose of canal locations, and for a feasible site for a diversion dam to be constructed across the Colorado River. The latter site was selected at what is known as the Laguna Dam Site, situated about twelve miles above Yuma. At this point the valley of the Colorado is contracted by hills of solid granite, which project down to near the main channel.

Water will be diverted at the Laguna Dam Site and conveyed to the irrigable lands by main canals on either side of the river. These main canals will be constructed along the foot of the mesa and at an elevation to permit of the distribution of the waters to valley lands below. On the California side there will be one main canal of capacity 200 second-feet, length 10 miles, with three main laterals. Total length of canal and main laterals, 22 miles.

On the Arizona side there will be one main canal, capacity 1600 second-feet, 16 miles long, with two branches 22 and 15 miles long, respectively, and 26 main laterals 80 miles long. Total length of canal and main laterals 132 miles.

The main canal on the Arizona side will be carried across the Gila River by means of an inverted siphon built of concrete, reinforced with steel, and sunk below the bed of the stream.

The Laguna Dam is of the Indian weir type, built of loose rock with cut-off walls of concrete and sheet piling. The slope of the down-stream face of the dam is 1 vertical on 12 horizontal. Total length of dam 4,780 feet, with a maximum height of 19 feet in the river channel, and 10 feet minimum across the lower reaches of the valley. Maximum width of dam 257 feet. The contents of the dam are as follows: 356,500 cu. yds. loose rock fill, 27,150 cu. yds. rubble concrete masonry, 80,000 sq. yds. rubble pavement 2 inches thick, and 53,000 lineal feet of sheet piling. The dam will raise the low water level in the river about 10 feet and form a settling basin above of an average width of approximately 1 mile and 10 miles long.

The purpose of the dam is two-fold,—that of raising the water of the river to such a height that it can be economically distributed to the irrigable lands, and also to form a settling basin for the disposal of the heavier silts which are carried in large quantities by the river, and which if allowed to enter the canals would become a serious menace to their carrying capacity.

Sluiceways will be constructed at either end of the dam excavated in the solid granite to the level of the grade of the river. The sluiceway on the Arizona side will be 116 feet wide, 800 feet long and 18 feet deep, and closed by three cast-iron gates of the stony type, each 33 1-3 feet wide and 18 feet high. The sluiceway on the California side will be 40 feet wide, 800 feet long and 18 feet deep, and closed by one gate similar to those on the Arizona side. The gates will be operated by power driven hoisting machinery.

The combined capacities of the two sluiceways with the river at flood is 31,000 second-feet. These sluiceways will be used for clearing the settling basin of silt deposits.

The headgates of the canals are arranged so as to take water from the surface of the reservoir. By this means only the lighter portions of the silts are taken into the canals. The velocity in the latter is sufficient to carry through the light silts and prevent the canals from being silted up.

On the California side there will be one main canal of 200 second-feet capacity, and 10 miles long, with 3 main laterals. Total length of canal and laterals 22 miles. On the Arizona side there will be one main canal of 1300 second-feet capacity, and 16 miles long, with two branch canals 21 and 15 miles long, respectively, and 26 main laterals with an aggregate length of 80 miles. Total length of canal and main laterals, 132 miles.

The Valley lands will be protected from inundation during flood seasons by means of dikes. These will be constructed on both sides of the Gila River, and on the Colorado from the Laguna Dam to the Mexican Boundary. These dikes will be of earth 8 feet wide on top, with side slopes of 3 horizontal to 1 vertical on the land side. The average height of these dikes is about 7 1-2 feet. Total length in California 14 1-2 miles, and Arizona 59 miles. In addition to the above flood protections, a complete system of drainage is contemplated to prevent the low lands becoming water-logged and alkaline.

Both the reports of the Department of Agriculture and past farming experience show that the soils of the Yuma Valley are very fertile. The silts of the Colorado River have high fertilizing properties, and as not all of them can be removed at the headworks, will be a constant factor in maintaining the present high standard of quality of the soils. The valley lands are suitable for the growth of staples, and particularly forage plants. The climate is such that crops grow throughout the greater portion of the year.

The contract for the construction of the Laguna Dam has been awarded to J. G. White & Co. of New York, and work on this dam has been begun. Proposals for the building of 12 miles of dikes have been asked for by the Secretary of the Interior, to be opened August 17th.

Final plans for other portions of the work have been prepared, and definite locations for portions of the main canals have already been made. It is proposed to carry on other portions of the work abreast with the construction of the Laguna Dam, in order that water may be delivered to portions of the lands at an early date after the completion of that structure.

The work of the Yuma Project is being carried on under the supervision of Mr. J. B. Lippincott, Supervising Engineer, Mr. Homer Hamlin, District Engineer, having direct charge of the work.

THE SACRAMENTO VALLEY PROJECT

S. G. BENNETT, Esq., Engineer, U. S. Reclamation Service

THE largest body of arable land in California is usually termed "The Great Valley of California," though it has recently been called the "heart of California." This valley is 400 miles in length and has an average width of 40 miles. The entire basin, including mountains and valley, has an area of 58,000 square miles. The Sacramento, or northern portion of the Great Valley, is 140 miles in length and 40 miles in width, and contains 2,661,120 acres, exclusive of the Sutter Buttes and the channel surface of perennial streams.

Taken as a whole the Sacramento Valley may be said to be of unsurpassed fertility, though its productive capacity for cereals has been greatly reduced by the long continued growth of this crop. To restore

its fertility rotation in crops is necessary. This, however, is impossible without irrigation. Comparatively little progress has been made in irrigation, though probably 2,000,000 acres will ultimately be irrigated in this valley. The Interior Department, through the Reclamation Service and the topographical branch of the U. S. Geological Survey, is now engaged in collecting facts upon which to base plans for irrigating this vast area. The work includes the determination of stream flow, the survey of reservoir sites, the designing of dams and other irrigation works, and the survey of the floor of the valley. The State of California has been co-operating with the Federal Government and has furnished some of the funds necessary to carry on this preliminary work.

The drainage basin of the Sacramento River contains approximately 26,000 square miles. The estimated mean annual run-off from this area is nearly 26,000,000 acre-feet, or almost sufficient water to cover the entire valley 10 feet deep.

The run-off from the watershed of the Sacramento River at Iron Canyon above Red Bluff for the months of January to April, inclusive, the four months of greatest discharge during a period of nine years ending with 1904, was 5,420,000 acre-feet, or 55 per cent. of the mean annual flow. The discharge from May to September, inclusive, the five months when there is the greatest need of water for irrigation, is less than 24 per cent of the total annual flow.

If the entire valley is to be irrigated, these facts emphasize the importance and necessity of storing the flood flow for use during the irrigation season. Numerous reservoir sites have been surveyed for this purpose. Those presenting the greatest advantages for economic construction which have thus far been estimated upon are: Guenoc, Clear Lake, Indian Valley, Briscoe, East Park, Millsite, Big Valley and Iron Canyon. From these eight sites the annual summer flow of the Sacramento River can be increased during the latter part of the irrigation season by more than 1,500,000 acre-feet of water, at a total cost of $5,800,000, or at the rate of $3.76 per acre-foot for construction of storage works. Liberated during the months of July, August and September, this would increase the flow of the Sacramento River and its west side tributaries by about 8,000 cubic feet per second. The low summer flow at Red Bluff is 4,000 second-feet.

In addition to the above reservoirs, six reservoir sites of large capacity are being surveyed during the present field season.

These reservoirs could be so constructed and regulated that, in addition to their value for irrigation purposes, they would play an important part in retarding the flood waves that have been so destructive to levees and crops in the lower Sacramento Valley, and materially lessen the cost and difficulty of reclaiming the overflowed lands, which exceeded 600,000 acres in 1904.

A board of engineers from the U. S. Corps of Engineers has been appointed to continue the study of the flood and overflow conditions and navigation problems of the Sacramento River. It is hoped that this work can be carried out in some such way as similar work is being done on the lower Mississippi River.

Until the topographic and soil surveys of the valley are completed, it will be impossible to give the location of the canals, the amount of land that can be irrigated, or the cost of the Sacramento Valley Irrigation Project. Because of the large area of fertile land; the large water supply; the great number of high priced products that can be grown; the good transportation facilities; and the nearness to market, this project presents the greatest opportunity for irrigation development to be found in America. When the high valley lands above the zone of overflow have been provided with irrigation systems and the swamp lands reclaimed and irrigated, it is believed that the Sacramento Valley will be capable of sustaining a population as great as is now being sustained by the entire State.

Reclamation of Swamp Lands

JOHN W. FERRIS, C. E.

AN earnest movement has been on foot during the past year, designed to compass the reclamation of the vast body of overflowed lands in the valley and delta of the Sacramento River in this State.

These lands when reclaimed, are "as rich as the richest on earth" and embrace something over a million acres.

Individual effort has already accomplished much in the direction of reclaiming these lands.

Grand Island, Pierson District, Sutter Island, Roberts Island, Union Island and other tracts show what may be done in the way of safe reclamation and attest, in a practical way, to the productive value of the land.

On these reclaimed lands are grown much of the vegetable product of the State: Vast fields of potatoes, onions, beans, asparagus and grain are the wonder of visitors who are taken to see them; and astonishment is frequently expressed that the reclamation of the land lying unreclaimed is not proceeded with.

Whilst a measure of success has undoubtedly been attained, however, many failures have been recorded; and the land reclaimed has much of it cost so high for embanking that there is little measure of profit, and a great deal of risk, attending this class of operation.

It is probably safe to say that the land, so far, successfully reclaimed has cost an average of $100 an acre; which is above its selling value at the present time when in a fit state for cultivation.

It is realized that the reclamation of any further material area, by limiting the area now serving as reservoir to equalize the effect of sudden freshet, must increase the dangers not only of the newly reclaimed tracts but of the area heretofore diked, and necessitate a material addition to the existing embankments. In other words, it is realized by those considering the problem that the river channels are insufficient to handle the volume of flood water presented to them; and the present effort has been in the direction of determining what rectification of existing channels or construction of new channels is necessary to warrant the further work required to render productive the territory now subject to periodical overflow.

As a result of the agitation and discussion of the problem an organization of the Swamp land owners known as the "River Improvement and Drainage Association" has been effected, and at its instigation a Commission of Engineers of high standing was appointed and a report submitted by it dealing in the most thorough manner with the features of the problem.

The matter resolves itself into the question of how the funds may be provided to carry out the work recommended.

Land owners claim that the deterioration of the river is to a great extent the cause that has prevented the prosecution of the reclamation of the overflowed lands; and say that little more would be needed than to restore the condition of the channels to that existing when the swamp lands were conveyed by the Federal Government to the State and by the State to their present owners.

The obligation of the Federal Government to maintain the navigable waters of the several States is one fully recognized, and from the fact that in recognition of the present movement Congress has taken the preliminary step of creating a Commission of U. S. Engineers to prepare a report on the condition of the Sacramento River and its tributaries, it is confidently believed that the Federal Government will do its share in the work. The land owners ask the State to supplement the work of the Federal Government in restoring the "original condition" of the channels to the extent of making them competent to transmit the flood wave to tide water, and

are ready to pledge themselves to carry out the further work of reclamation.

It would not be fair to look on this movement as one to reclaim the lands of individuals at the expense of the State and Federal Governments. No reclamation work whatever is asked; nothing more than providing such channels to carry flood waters as may justify the reclamation of the land.

Surely the State is justified in doing something to add so valuable a territory to her productive area. The assessed valuation for taxing purposes of Reclaimed Swamp Land is ten times greater than of that which remains untouched, and further benefit to the State of maintaining a population engaged in the intensive farming this land warrants is apparent to all.

Of course such great Government projects as the improvement of harbors, etc., are not dealt with in this issue which is devoted exclusively to that work which will make homes for homeseekers by Government assistance. There are in California many regions not mentioned in this issue which have been considered somewhat unofficially perhaps for government work under the reclamation act.

The great work of reclamation now being undertaken by the National Government is of vital interest to every Californian, whether he be a prospective settler or not. It brings water, the Life of the Land, to enrich the arid tracts as if by touch of a magic wand, studding the desert with happy homes; it is a movement of special interest to California sociologically as well as industrially. The impetus given to desirable immigration by the new and fertile lands will mean increased prosperity for the State at large, and it is hoped that all sections will unite to further the movement for reclamation.

Irrigation means making waste places populous; it means more than that. Irrigation in California means that the land can be cultivated the year around, and even where the rainfall is sufficient for ordinary crops. Irrigation is practiced with success in California to make the earth bring forth more than it would yield under usual conditions.

With California's all-the-year climate, irrigation in this State means more than it means to perhaps any other region of similar area.

To assist in the Government movement for National Irrigation, California must have a united people in this work and a united Congressional Delegation at Washington.

The Government is doing the great work of irrigation in the West, under the National Reclamation Act, to make room for the homesteader, to create a new frontier. Therefore, it has wisely limited the size of the homestead which any man may take up to 160 acres. Although the Government endeavors, as far as possible, to bring water to available Government lands, yet in the event that private owners are willing to subdivide their lands and in other ways comply with the National Reclamation Act, the Government will undertake the construction of irrigation works even where the land is in private ownership.

In California much of the best land for Government irrigation is in huge private holdings. It is believed that every great land owner in California will be willing to sign a contract to subdivide in order that the Government may proceed as rapidly as possible to construct irrigation works under the National Reclamation Act.

Already owners of more than seventy huge tracts of land have signified to the California Promotion Committee their willingness to subdivide their lands for the benefit of intending settlers. This shows which way the wind blows and may be taken as an indication that when the Government is ready to go ahead our patriotic landed proprietors will be willing and ready to cooperate.

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Vol. II. No. 11. OCTOBER, 1905.

THE CALIFORNIA PROMOTION COMMITTEE

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THE JOY OF OUT-DOOR WORK IN CALIFORNIA.

THIS PICTURE SHOWS ONE OF THIS MONTH'S CONTRIBUTORS AMONG HER POULTRY, AND WELL ILLUSTRATES THE HEALTHFUL NATURE OF OUT-DOOR OCCUPATIONS IN CALIFORNIA.

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A Great Profit-Yielding Poultry Farm Conducted by a Woman.

MRS. O. H. BURBRIDGE.

CALIFORNIA imports each year from the middle west hundreds of carloads of eggs and dressed poultry, for which high prices are obtained in the markets. Why we should not only supply our home demand but also send hundreds of carloads from this State to the East each year has been a source of wonder to me ever since I engaged in poultry raising. The prices of dressed poultry and eggs for market use are always so high that the man who does not care for fancy birds can always make a good living furnishing hotels and private families with stock.

I have established on my ranch in Los Angeles a fatting plant on which the birds are fed according to the method used in England, where they are placed in long rows of crates four or five birds to the crate and fed twice a day in troughs placed in front of the crates. For the first week I use the best oat flour and sour milk made into a mash and gradually thinned so that the food is like thick gruel by the end of the fatting period. This time varies according to the stock, a Mediterranean taking a week or more longer than the American, English or Asiatic classes. For this fatted stock I have never received under thirty cents per pound, and in some seasons of the year as much as forty-five cents. This year one of the largest restaurants in Los Angeles has offered me fifty cents per pound the year round for Orpington Ranch capons. The egg market has always been very steady and prices have been high so that a good profit can be realized on eggs alone, by selling off the young cockerels and saving the pullets each year just for market eggs.

So many inquiries come to me as to poultry raising in California indicating that a false notion exists among many Eastern and Northern breeders as to the ravages of roup and lice. According to many of the inquiries this part of the United States is referred to as being visited by these two evils. I have raised thousands of chickens myself, taking all of the care of them from the egg to the mature fowl, and have had no trouble with roup whatever. True I have had sanitary surroundings, clean yards, plenty of fresh, cool water for my birds and well ventilated, draughtless sleeping quarters. I have found that with due care the lice are no worse than in any other section, but the watchword of the poultry raiser from the time the egg is entrusted to the incubator or hen until the bird is ready for the table, breeding pen or show room, should be "cleanliness." By that I mean no lice, clean straw to scratch in, clean water to drink, clean houses so no foul odors can disturb the good the day has brought. This habit of cleanliness is easy to establish on a ranch when the work is done systematically, but a poultry raiser cannot do part of the work one day, nothing the second and catch up on the third. It is necessary each day to do for the comfort of the flock all these little things and the hen is a most grateful creature, repaying kindness by filling the egg basket and incidentally one's pockets.

I started with a trio of Buff Orpingtons, after a trial of several other breeds, and when I found the chicks were so easy to raise and so sturdy, I purchased eggs from several of the large Eastern and English breeding farms, so my first year I went into the show room with a fine lot of stock. I took three silver cups and over one hundred ribbons on an entry of thirty birds in two shows, and then started to work in earnest to build up the strains I had. I was able to supply a great number of settings of eggs to my fellow fanciers at good prices, and my second year saw me start the breeding season with twelve hundred fine birds without a cull in the lot. I had the eggs booked in early January for the remainder of the season and had many orders for breeding stock that I was not able to supply on account of the egg orders. I have always purchased a fine breeder in England or

America whenever I was able to get just what I wanted, regardless of the price, and I never lost money in doing so, for the big Eastern breeders have engaged eggs of a famous winner from me before I saw the bird myself, and I have always had a steady sale for my best at all times in California.

My experience in raising poultry has been to me a most interesting one. From the very first I have taken not only a keen interest but a great delight as well in this work. It has been this joy in the work that has prompted me to build up my ranch from a very modest beginning to the big specialty ranch it is now. I now have one hundred breeding pens and my fattening plant has a capacity of 5,000 birds every three weeks. How my efforts have borne fruit you may guess, when I tell you that this extensive establishment has grown up from my modest beginning with three chickens. it has proved not only pleasant but profitable and my zeal has kept pace with my experience and understanding of the business.

I take a keen delight in conducting my business, and it is not from necessity but from choice that I myself buy all the supplies, hire the needed help, superintend the construction of new buildings, attend to the mixing of grains and the grinding of feed, prepare my own remedies for sick fowls and treat them when ill. All this fills in a busy life—a life in which these healthful pursuits carried on mostly out of doors are the greatest charm as well as a source of profit, yielding me a clear gain of $5000 in only fifteen months.

A Woman's Triumph On a Ranch.

MRS. E. P. BUCKINGHAM.

SOME months ago, in response to repeated requests from various persons, I told in a former number of this magazine, "How I came to be a fruit-grower." Since then I have been asked to say something regarding my experience after acquiring my land and planting my trees. In the former article I closed with the statement that I commenced with the intention of planting twenty acres, but, carried on by my growing enthusiasm, I did not stop until one hundred and forty acres were covered with trees and vines.

After the land was bought and there was no retreat a reaction began. I would go and look at the great field where nothing was to be seen on the brown earth but some short sticks not as high as my knee, without a single leaf, then go home and toss and turn hour after hour at night, possessed by the thought that I had done a most unwise thing. If I slept, I dreamed of endless rows of tiny black twigs that would stand there year after year, silent witnesses to the folly of a woman who had wandered from her sphere and was being justly punished for it. When the rain fell and the warm sun began to shine again and the buds to swell, and finally when the tiny black twigs were covered with tender glistening leaves, my delight and pride were boundless, and I forgot my former doubts and despondency.

I found kind neighbors who were willing to instruct me, but lack of confidence made me afraid to undertake the cultivation of the ground and care of the trees and I engaged a superintendent. He was six feet eight inches tall and I think I must have decided he would save me in step ladders when I might need them for fruit picking. My little trees had been planted in a field where wheat and barley had grown for thirty years. The sun was warm and the volunteer wheat and barley sprang up and grew strong and tall as though not to be superseded by those interlopers. Presently the tops of the little trees were completely hidden, I could see one head of barley nod to another a rod away, and hear them say, "we'll show them what will grow here." All about the borders and through the fields the yellow poppies and purple lupin bloomed. Clumps of sweet elder sprang up as if by magic, making a beau-

tiful picture set in a framework of soft green hills, that I was never tired of looking at.

Sometimes when driving about I would meet a neighbor who would ask how my trees were getting on or compliment me on the fine crop of volunteer barley I was likely to get. Another would ask if I intended to plow this year. One said, "I suppose you know the barley would grow without the trees," and I thought I detected a latent sarcasm in his tone suggesting the query as to the converse of that proposition. Then I would look at my tall overseer who seemed in no hurry to commence plowing and stifle my momentary uneasiness. One day I overheard a man saying "look at that now, where are the trees, pretty expensive crop of barley, I think"—"well," was the reply—"what can you expect of a woman and a city woman at that?"

That night when all were sleeping, I walked in the bright moonlight along the road by the orchard or barley field—for by that time the question of supremacy was settled. It was no longer a question of faith in my tall overseer, but a lack of faith in myself. I must get a new man, but whom. Just then, an owl, far away, answering my anxious thought said, Oh—who—who. Another owl close by answered—Oh, you—you. I went into the house, and in the morning met my overseer as he was dragging his lazy length towards the breakfast table, and gently suggested that he should take a vacation. "Barkis was willing." While hunting for a man to fill his place I demonstrated the fact that I could do perfectly well without one.

I found there were many things I could do to further the work. I could not plow, but I could take the plow points for sharpening, and in that way save the time of a man and two horses. I became so accustomed to the jingling of plow points in my phaeton that I felt quite lost if I did not hear them. Once when there was a rush of work pruning, planting, etc., I was advised to roll a field of barley that was growing rank and tall. Just then a horse became sick, and the man who was driving the roller had to go to the hills to get another. I knew the horse he went for, and know it would be the work of time to catch her. The roller was a borrowed one. I had promised to return it that night; if the work was stopped I must break my word or let the barley go unrolled. I looked at my clean white wrapper, hesitated a moment and then mounted the roller. After I overcame my reluctance to crush down the broad green blades, I found it quite an easy thing to do. I confess as I approached the county road that bordered one side of the field I always scanned it closely. The roller went home that night and the barley was rolled.

Since then the little trees have become large and strong and for several years have been giving me an average of six hundred tons of fruit yearly. Some one here said women never measure by feet and yards, but by inches. It may be quite as difficult to estimate tons of fruit, and the quantity will be more easily comprehended if I say, let us suppose all the six hundred tons of fruit were packed fresh in boxes, as we do pack, and sent in refrigerator cars over the thousands of miles of mountain, desert and sea to the cities in the East and to London and Liverpool, they would require a train of fifty cars to carry them all. Part of the fruit was dried, and that sent fresh was sent at different times, but the six hundred tons would represent fifty carloads of fresh fruit. I have had many things to contend with, many mistakes to rectify and pay for, many amusing experiences which I may give you some day if you wish, but will say, taking all things into consideration, I think the woman orchardist has no more to contend with than those engaged in other pursuits, Even the pleasures of life are not unalloyed.

I am asked if I do not find the life monotonous. No. Each day brings some new interest. There is a great pepper tree near my house where two little Jerseys, Ursula and Phebe, were feeding, and where they stood and looked after me with great soft eyes as I bade them good-bye on leaving for town.

BEEKEEPING FOR WOMEN IN CALIFORNIA.

MRS. J. B. AMES.

ACTUAL experience has proved beekeeping to be a profitable as well as a healthful occupation for women in California. The ready market for comb and extracted honey removes all difficulties in disposing of the product of the busiest of all animals, and the mild climate permits the outdoor work necessary for the care of the bees during a long and pleasant season.

The woman who would keep bees, either to supply her household needs or with a view to earning a living, has but to understand and apply the two following very simple essentials to the profitable raising of bees. They are, first: that the animal life be properly nourished, and second: that Nature be so assisted by intelligent methods of keeping and reasonable care as to give best results to the keeper. But these essentials may be supplied here in California with a minimum expenditure of work and money. So many localities furnish abundant food for the bees that the question of feeding them is solved for the keeper, while by an intelligent selection of location and methods of handling the best results are easily obtained.

There being no winter problem in California it is not necessary to carry the bees with six months' supplies into the cellar. In colder climes the bees are "wintered" in cellars, where from Thanksgiving until the middle of April the hives are stored in cellars for protection, in spite of which, however, winter loss is common. A beekeeper in Wisconsin writes: "On April 12th I took out the last bees. From then till the 22d we had heavy frost and cold weather. On the 26th and 27th the weather is so unfavorable that one day they work and the next day they have to lay up again on account of high winds and cold." We in California have but to read this from an Eastern beekeeper to appreciate the advantages of California's wonderful climate for beekeeping. In fact it has been the writer's experience that the bees not only stay on the same stands but also gather nectar every month in the year, so that in the early spring they are in good condition to work and increase. All the work attendant upon the keeping of bees can thus be readily done by women and the prevailing wholesale prices of 10 cents per pound for comb and 5 cents for extracted honey yield a handsome profit to the industrious keeper.

That there is room and that there are abundant opportunities for engaging in beekeeping in California is shown by the present problem of disposing of the annual increase. And why should not women take up this industry since it is so pleasant and profitable an occupation for women? At present it is largely confined to farmers' wives and daughters, who already have many duties to perform, but the pleasant nature of the work bids fair to attract women who will be able to devote their attention and energies to developing the industry on a larger scale.

It is a well-known fact that honey-bees will select a home in a hollow tree and there not only attend to all their natural wants and provide for an increase, but also lay up a surplus store of honey. Climatic conditions in California are so favorable that it only remains for man to turn them to his benefit. Here there is no expense for feed for the bees feed themselves the year round. They not only feed themselves but also feed and care for their young, thus relieving the keeper of much care so that there is no need to interfere with the increase except at the swarming season, then to provide new homes for the new swarms, where they can thrive and work and produce that delicious food the value of which I trust will some day be fully realized by rich and poor alike.

Although California's output of honey in 1905 will be the largest in many years, it will be quite insufficient to meet the extraordinary demand caused by the short crop in other States. One State usually leading in honey production will produce hardly a fourth of a crop this year while another is nearer to a honey failure than it has been for twenty years. Here is women's opportunity in California to enter this profitable business, which has also always been to the writer a pleasant one.

ONE OF CALIFORNIA'S FINEST RANCHES—A WOMAN'S ENTERPRISE.

MRS. M. B. SHERMAN.

THE pleasures of life are full of simple happiness in the country, for there is leisure to enjoy nature, books and friends. The family are gathered closer together by the long evening without distractions to draw them from the fireside. Yes! How much affection the ranch affords. After the family, come the faithful animals, the horses that neigh at the sound of your footsteps, the cows that turn their soft eyes to see who is patting their sleek sides, and all the lesser ones that show affection for you. Sometimes after an absence from home it seems as though even the trees and flowers breathed forth a welcome.

In the year 1884 the failing health of my father brought the entire family to California for a permanent residence. Leaving Philadelphia, with its busy social life, and the opportunities of a city, the change to California was a happy one.

My father and mother, believing it best for girls to be independent, gave me some money to use as I thought best. After looking around for an investment that promised well, through the advice of a family friend I purchased a section of land five miles from Fresno, intending to sell it again when values increased. There was a new, but rather queerly built, house on the place. The land was raw and unimproved with the exception of ten acres of wine grapes, four acres of old vineyard of mixed varieties and thirty acres set to almond trees.

The warm dry air of the valley helped my father's lungs, so after a little time it was decided that the family should live in Fresno county for at least part of the year. But after a year of wheat planting the spirit of the neighborhood prevailed and a forty-acre muscat vineyard for raisin-making was planted. This was steadily added to until there were two hundred acres of muscats. Meanwhile Bartlett pear, olive and peach orchards followed and then a table-grape vineyard. The raisin-grape vineyard afforded sufficient revenue to carry the expenses of the young orchards until they themselves became profit-yielding.

When the family moved to Fresno, it was found impossible to purchase butter fit for table use and it was often unfit for cooking. Sending East for books, I took up butter-making and soon found that I had as well to study cows, stables, and the cleanliness of the dairy. The alfalfa taste which in some places is noticeable had to be kept out of the milk as it was impossible to remove it with any means I could command. This taint was conquered but had lead into the study of bacteriology as far as making cultures, to find where the control was needed, and of the cultivation of the bacteria essential to high flavor. The knowledge that we had good butter on our table quickly spread among friends and they begged for a roll or two a week.

I was thus carrying on butter-making on a small scale with the usual farm outfit when the need came for more money to carry out my larger plans and the surest source of income on the ranch proved to be the dairy. More cows were secured, a small separator and a Babcock test followed. As cows were scarce two carloads of Arizona nondescripts were purchased and milking-time for the next month or two was a Buffalo Bill show. The dairy proving a success, fifty head of registered Holstein yearlings were brought from the East, and a steam plant with large separator and power churn were added. This was the first alfalfa creamery and won the first gold medal ever given to alfalfa butter. The two hundred cows paid in seven years an average of $51.65 a year per cow.

With the registered cows came the fascinating study of breeding to increase excellence, to build constitution, and to eliminate weakness and defects. The success of this study has been shown in the results I attained, for in the third generation came Juliana De Kol, the World's prize milk and butter producing cow, which the California Promotion Committee

sent to the Buttermakers' Convention held in Chicago during the World's Fair. Fidessa, a winner at Sacramento for several years, and over twenty other cows with records of over twenty pounds of butter per week were bred here on my ranch.

Another success has been attained with table grapes. By careful selection the Emperor has been developed into a heavy bearing vine with large highly colored fruit in magnificent bunches. When these grapes were first shipped from the ranch the packing was done in Fresno, where the large bunches were cut up to fit small baskets, eight of which were put into a crate. Their value for table use was almost completely destroyed, so I opened a packing house at the ranch and by laying down the sides of the small baskets managed to pack the bunches uncut. The next season larger baskets were ordered and all the crate stock was ordered for single crates. Ribbons left from the previous season's raisin pack were used for decoration, and they sold at once for a dollar more a crate than the rest of the pack. Each year we pack with the same care and now after having heard that the large package was often more than a family cared to buy of high priced fruit, I tried one year sawing some crates in half, thus making a smaller package. This also sold well, so that we try to place in each car seventy-five half crates. The returns from the Emperor vineyard have always been good, ranging from $10,000 to $15,000 a year after freight refrigeration and packing material have been paid for. Like the care of the cows this has been a most interesting work, for in all life the same laws prevail, and if the grower does not constantly build up the strength and carefully select his vines and trees there will be only a minimum of success. Pedigree is as important in a plant as in an animal. In the vineyard fertilizing and pruning, spraying and clean cultivation put the vines in the best conditions for bearing. Quantity of fruit must give way to quality, for quantity makes pigs' feed, while quality makes money.

My olive orchard also has a pedigree, being only two generations from the trees of an old mission. We had a friend who grew the trees from cuttings from the bearing wood of his own orchard. At four years of age these trees bore a half crop and have not failed since. The olives are so large and fine that the first two sizes have been sold under a five years contract for $75.00 to $80.00 a ton f. o. b. Fresno. The smaller olives are pickled for local trade and oil is made that sells readily in the East in case lots among private customers.

These are successes, yet without a few failures they would be less sweet. The beautiful Bartlett pear orchard, just when at its best, and when the brand had built up a reputation for good packing and prices were increasing, the blight came. Though each winter, in hopes of saving at least a portion the blight was carefully removed under antiseptic conditions, yet each year the trees had more cut off than the summer growth renewed, until only pitiful stumps remained and these were finally cut up for fire wood. The second failure was the peach orchard. It bears well but "haste made waste" and the trees were foolishly bought, instead of being grown and budded to order. They were labeled as Early Crawfords, Muirs, and Orange Clings. How many varieties of peaches are cultivated I do not know. I feel sure, however, that I have every one of them in the forty acres.

Now, I have tried to tell you about a woman's experiences in ranching. I find ranch life full of joy. To all it is not given to create pictures on canvass or to enrich literature. These are special gifts. But who cannot plant a tree and make a picture against the sky? My memory calls up the picture of the Fresno plains of twenty years ago, covered with yellow stubble, the sun burning down and spirils of dust whirling up like dancing dervishes, the only motion in the tense stillness. To-day, my vines and trees spread a living green over these plains, the birds sing, and the cool sweet wind comes over the alfalfa fields when the cows are standing knee deep in the purple-tinted greenery.

Yes! it is a life worth living, for when the time comes to fold my hands in a quiet old age, how much sweeter will be the rest, for the struggle toward improvement has been with kindly nature and not with restless humanity.

How I Make Olive-Growing Pay.

MRS. PREDA EHMANN.

THE olive industry in the State of California may be rightly termed one of the most important of the many which this State has developed. Since the first trees were brought over from Spain by the Mission fathers and were planted in the southern part of the State, olive culture has traveled successfully to the northern part of the State and is today found as far north as Tehama County, 300 miles above San Francisco.

I wish to call attention to a mistake which is so often made by taking it for granted that the olive tree will grow anywhere and under any conditions. Experience has shown that the tree may grow, but the grower must not be surprised to find a small and undeveloped fruit as a result of poor soil and lack of irrigation and cultivation. Olive trees are planted 60 to the acre, and if large trees of good stock, say four years old, are planted, they will yield a good crop in five years. From smaller cuttings, however, you cannot expect a crop under seven years. It has been the writer's experience that wherever olive culture has not been a success, it was because of local conditions or lack of attention and special knowledge.

As it requires skill and experience to prepare the commercial olive by pickling, it is necessary for the grower to be located near a general pickling plant so as to dispose of the crop advantageously, in case one cannot or does not feel disposed to do one's own pickling. The demand for raw olives is constantly increasing, while the prices paid are from $40.00 to $75.00 per ton delivered at the factory. It can be readily seen that this is a lucrative branch of horticulture. When we consider that California is the only State in the Union where olives are grown successfully, it may easily be understood what an extensive market there is open for California olives and olive oil.

I would, however, advise the planting of the large Mission variety only. My varied experience with all varieties authorizes this statement. Other varieties may have large fruit, but are not as desirable for the purposes of pickling as the Mission olive, nor are the tree and the fruit as hardy, and oil from the Mission olive is considered by the trade to be the best and brings the highest price in the market. In former years the Redding picholine was considered the best olive for oil and was largely planted for that purpose, but by my advice to some of the growers, their trees of this variety have been grafted over to the Mission variety with the best of results. I may say the same of the Rubrias and other fancy varieties which are selected and planted from the catalogue without experience and knowledge of their commercial value both for pickles and for olive oil, and this, I might add, has been in a great measure the cause of some disappointment and dissatisfaction to olive growers.

At the present time packers should encourage the olive industry in California by paying the best possible price for olives, delivered or on the trees, as the acreage is not nearly sufficient to satisfy the demand of one large concern alone. The land in Yuba, Butte and Yolo counties is especially adapted to this industry and as the harvest of the olives comes at a time when the other farm work is over, there is ample time to give this fruit proper care in marketing it. Cheap land, plentiful water, favorable climatic conditions and a ready market combine to make California the best place on earth for the successful propagation of olives.

Any woman who feels inclined to pickle and prepare her own olives for the market, will always find ready sale for the California ripe olive, but I wish to repeat that by furnishing a poor olive to the trade the reputation of the California ripe olive is thereby exceedingly endangered. I have found in my own experience that the Eastern people who know and recognize a fine, well flavored California ripe olive, are ready and willing to buy, but where a poor olive has been placed upon the market, it is impossible to get these parties to give the California ripe olive another trial.

Within the last five years, California olive oil has come to the front and is to-day recognized as the best of the olive oils on the market. While the margin on pure olive oil is not as large as it deserves to be, there are

still encouraging results which invite the grower to increase her acreage as the making of oil uses all the small olives which otherwise would be rejected as pickles on account of their size.

In conclusion I would urge in the interest of the California olive industry the planting of the large Mission variety only, and if you have good soil and ready irrigation facilities and treat your olive orchard as you would any other orchard, namely fertilize and cultivate carefully, you will find that your efforts will be amply repaid. If you do prepare your own fruit and make olive oil from your own olives, make it a rule to furnish the very best as this will help to benefit this important industry and in the end assure you a better financial return.

A College Girl's Experience in Poultry Raising.

KATE ELLIOTT TROWBRIDGE.

A YEAR ago last July I arrived in Glen Ellen a thin and tired out college girl. Since then I have gained muscle and strength that I never thought to have and have done more hard physical labor than I ever thought I would be able to stand. I have practically lived out in the open and though my arms, face and neck are brown as berries I have the satisfaction of knowing that I am stronger and healthier than any girl friend I have. I attribute it all to the out of doors work.

Our specialty is chicken raising, and while I have only had the incubator and incubator chicks to tend to, I can freely say that there is no part of chicken raising in California that a woman could not do. In fact, it is a business especially adapted to women, for it is light enough not to burden her, yet vigorous enough to give her strength and health. And, too, it consists mainly of small daily duties which women seem especially suited to perform successfully.

I say all this of chicken raising in California. California's climate is ideal when contrasted with that of the East. There is never a day in the winter when a woman, properly dressed, cannot tend to her duties in caring for the chickens. And there are very few days that even young chickens cannot be out doors part of the time. Last January I had a brood of chicks numbering 330, right in the midst of the longest continued bad weather we had and I think there was not more than a week altogether that they had to stay inside. And it was not an unusually good winter either.

Of course in the northern part of the State they have snow and in the central valleys it is very hot, but along the coast, especially counties immediately surrounding San Francisco, is a thriving chicken raising region. I think it is safe to say that the climate of this part of California cannot be rivalled for poultry raising by women, or any one else, as far as that is concerned, in any other part of the United States.

As I said before, I have had charge only of the incubator and the incubator chicks, but I see and know enough of the other greater parts of the work to be able to do them if I had to.

The preparing of foods and the feeding the hens are not hard if the dry feed system is used, though it takes constant thought and study. Each pen of hens is different from the others and each has to have its special treatment. Then the gathering and the packing of the eggs is no small item of work though it is an easy and pleasant occupation for women.

But the most interesting part of all is the caring for the baby chickens. Both the incubator, when it is running, and the chicks need constant attention. Though unceasing the care of the chicks is, for the most part, easy and thoroughly congenial, to me at least. The cleaning the brooders and brooder house is not pleasant, but it is not nearly so disagreeable and hard as I at first thought it would be.

Besides the actual caring for the chickens it is almost necessary for the successful outcome of the business to have a garden. Green food is absolutely essential to the best development of chickens and there is nothing so good for a woman as gardening. It rivals all the gymnasium exercises one could take. So taking it altogether I can, with a perfectly free conscience, advise any woman who wants an independent, profitable and healthy occupation to go into chicken raising in California.

Silk Culture--Its Great Future For Women in This State.

LIBRARY OF THE UNIVERSITY OF CALIFORNIA

MRS. CARRIE WILLIAMS.

THAT women can carry on silk production to its fullest extent in California, has been demonstrated beyond all dispute within the past few years. The necessary requirements for this are all to be found in superabundance in our great golden State.

Our soil is varied and of the richest character. Its depth in the valleys and its strength in the mountains and foothills is unsurpassed in any clime.

Silk of the very best quality may be produced in every county in this State with as little, indeed with less labor or expense than is the case in China, Japan, or any of the European countries whence we import this world-wide commodity of every-day use. The silk season in the northern and middle counties of the State can be made as long as in most foreign countries, while in the southern counties, especially in San Diego County, it may be extended to eight or nine months of the year. That silk can be produced during this long period stands recorded as a fact demonstrated for years past.

By careful pruning, planting of cuttings, cultivation and a moderate amount of irrigation the different kinds of mulberry tree best suited bear foliage for nine months to a year.

There is no scale or pest indigenous to the mulberry tree and they grow as much in California in one year as they do in Europe or Asia in three. Our virgin soil coupled with the generally diffused scientific knowledge of our people how to suppress that which is not best and supply that which is lacking, gives us a distinct advantage as to the possibilities that may be attained in the development of this grand industry. With all these things and very many more that cannot be presented in one short article the question naturally arises, "Why is not silk-producing a success in this country?" The sole and only reason is because it has never been judged aright. Time and again people wholly unacquainted with the business, have rushed into it hoping for large returns from small investments, and others with reasonable investments have been disappointed in not reaping unreasonable profits.

Within the last decade the number of silk factories in the United States has multiplied fifty per cent, so that while less than thirty years ago, we as a nation, manufactured only fifteen per cent of our own silks, now we send out from these many looms eighty-seven per cent of all the silk worn in the United States. And, these manufacturers pay to their employes twice as much as they do in England, three times what they do in France, three and a quarter what they do in Italy, and probably twenty times as much as they do in China and Japan.

There is no special advantage in this country for the manufacture of silk and yet the silk manufacturers accumulate and retire on as ample fortunes and in as short or even shorter time, than any class of business men in this country. Why is this? What is the cause underlying effect? To keep these factories going there is every year imported $50,000,000 worth of what is invoiced as raw silk though it is not raw but twenty-five per cent manufactured. There is no duty on raw material. On manufactured silks there is a duty of sixty per cent. Upon reeled silk there should be about one-fourth of this duty. It is not difficult to see that fifteen per cent of $50,000,000 is lost to the revenue of the country and added to the profits of the silk manufacturers. The government officials seem to wink at this fact and pass on to other matters year after year, while the general public do not stop to think or to investigate where the wrong lies.

The government through the Agricultural Department has been for many years making a grave mistake in not taking the proper steps to educate the people in this industry. There is not one school or college

in the United States devoted to the giving of thorough instruction in this world-wide industry. All other silk-producing nations seek by every means to give instruction in the art of raising silk worms. Not only is there no college set apart for instruction in this industry, but there is not a chair in any university throughout the whole country given up to this work. Neither are the rudiments taught in the schools, nor are they to be had in the libraries. Mention is made of the industry in the encyclopedias, but such information is mostly misleading as might be shown if space permitted.

What is required to establish the silk business on a solid paying basis in the United States with headquarters in California is the establishment of a station or school of instruction in every locality where mulberry trees flourish and the silk worm can be raised. At these stations mulberry trees should be propagated and cuttings and young trees should be given free of charge to those who want to engage in this industry. Competent persons should be appointed to teach young men, women and children the entire routine of silk worm raising from the egg to the egg again. Literature should be written from a practical point of view in this country and distributed to all interested. This State will undoubtedly soon take hold of this question and bring before the Department of Agriculture the advisability of taking steps to set the silk industry in motion throughout this country where conditions are so favorable for establishing it. When this is done companies will be organized with capital and efficient managers who understand the requirements of the work and who will see the special advantages we Americans possess to carry out this enterprise that will unquestionably result in benefit to the people at large.

Women who are now entering all the avenues of business can take up the production of silk and if they combine the manufacture of the same the profits are in proportion to the investments. From one to five acres at least should be given to this work. The trees should be of the best varieties and must be properly cared for. Persons undertaking to raise silk worms should understand their nature and how to treat them. This knowledge is within the grasp of any woman in our favored land. What China, Japan, France, Italy, Syria and other smaller countries can accomplish we can do and do better if we give it our best efforts.

We have all the essentials within our borders. Let us awake and show to the world that we can produce our own silk as well as our own cotton.

Why the California Girl Excels in Size and Strength.

PROF. W. E. MAGEE, Director of Physical Culture, University of California.

THE most comprehensive and trustworthy statistics yet published relating to the general physique of Eastern college women, are from Wellesley College. Comparing the measurements of the average University of California girl student, with those taken at Wellesley, we find that the native California girl surpasses her Eastern sister in the matter of general symmetrical development

It has been proved by statistics of native-born California girls of the age of those who attend the large private schools and seminaries throughout this State, that the California child is not only taller but heavier and stronger, than the Eastern child of the same age.

A study of measurements taken under my supervision of children attending the above mentioned schools, shows that the native-born girls average better than those attending the same schools but born elsewhere, while all show better measurements than girls of the same age attending the same class of schools and seminaries in the Eastern part of this country. So it is not surprising that California girls of more mature age should maintain their superiority.

Of the many reasons that are ascribed for this difference, it is agreed that the climate is more responsible than any other factor in bringing

about these results. The growing animal is as sensitive as the growing plant to climatic conditions and changes. The extreme cold of the East has undoubtedly the effect of checking the growth of the people there, just as it does the growth of the vegetable world. The mild winters of California allow the growth to continue uninterruptedly all the year around. While in the interior the extreme summer heat would seem somewhat severe, the coolness of the nights provide that season of rest which is absolutely essential to the health of the growing girl.

A very important reason depending directly on the climate is that California girls indulge in much more outdoor exercise than those of the Eastern States. In no other place in the world do girls habitually take such delight in real mountain climbing and camping as in California. The practical results of this health-giving exercise is shown by a glance at the anthropometric table; for the tests show that California girls have nearly twice the leg strength that the Eastern girls have. The Wellesley girl's strength is rated at 200.6 pounds; that of the California girl at 341.6 pounds.

There is one striking feature of the measurements in which the California girls exceed both the standard and the average Eastern girl which may have an influence in bringing up the other points of her development. The Raphael standard women would have a lung capacity of 159.8 cubic inches, her height being five feet five inches. The California girl whose average height is nearly two inches less, has a lung capacity of precisely the same volume—which is about ten cubic inches more than the lung capacity of the Wellesley girl. This greater lung capacity can but mean a greater and purer supply of blood under given conditions, and a consequent greater physical growth in the girl having it.

Another influence bearing on the greater size of California girls is the question of racial and hereditary tendencies. The pioneers of early days were men and women of strength and courage. A large number of them came from the Southern States. They were, as is well known, a large and full-blooded race, and have undoubtedly transmitted these characteristics to their descendants.

The following table, showing the average measurements of University of California girls compared with Wellesley, Mass., College girls, though usually given in the metric system of measurements, is here given in the English system for the sake of clearness:

University of Cal.		Wellesley College.
	Age.	
19.1 years		19.1 years
	Weight.	
119.7 pounds		119.4 pounds.
Inches.	Height.	Inches.
63.5	Standing	63.2
33.1	Sitting	33.3
Inches.	Girths.	Inches.
12.4	Neck	12.2
30.6	Chest, repose	28.8
33.1	Chest, inflated	31.4
25	9th rib, repose	24.6
28.1	9th rib, inflated	27.2
24.2	Waist	24.6
37.6	Hips	35.2
11.4	Right upper arm	10.6
11.3	Left upper arm	10.4
9.1	Right fore arm	9.6
9	Left fore arm	8.5
21.4	Right thigh	21.6
21.3	Left thigh	21.6

University of Cal.		Wellesley College.
Inches.	Girths.	Inches.
13.8	Right calf	13.3
13.6	Left calf	13.3
Inches.	Depth.	Inches.
6.9	Chest	7.2
6.8	Abdomen	7.3
Inches.	Breadth.	Inches.
4.3	Neck	4
14.8	Shoulders	14.3
8.7	Waist	8.7
12.9	Hips	12.8
Pounds.	Strength.	Pounds.
178.5	Back	130
341.6	Legs	200.6
72.7	Right forearm	57.3
61.7	Left forearm	48.5
61.7	Strength of chest	57.3
Cubic inches.		Cubic inches.
159.8	Lung capacity	150.3
Inches.		Inches.
63.8	Arms extended	63.8

GROWING THE NEW EVERBEARING CRIMSON WINTER RHUBARB.

AN INVITING INDUSTRY FOR WOMEN.

MRS. THEODOSIA B. SHEPHERD.

THE most valuable acquisition to the horticultural world in many years is the new everbearing crimson winter rhubarb, tested, introduced and recommended by Luther Burbank. It promises to become the most profitable thing the soil produces. Its superiority in every way to the old deciduous rhubarb makes it by far the most desirable variety worth growing in California.

This new prodigy of the soil is ever-bearing, requires no stringing, has a mild acid taste combined with a delicious berry-like flavor, and when properly cooked its sauce is a most beautiful bright strawberry red. There is no fruit offered in the market which when stewed excels it, either in delicacy of flavor or in beauty. It is easily grown and comes into bearing the first year, paying all the expense of plants and cultivation, picking, packing, etc., and a handsome profit besides; while the following years the profit is enormous. From a little over three-quarters of an acre last year the writer gathered and shipped seven tons of stems from January 10th to July 10th, at which last date the plants were seventeen months old. We received 4 1-2c to 5c per pound. A much better price could have been realized if we had sought a market outside the State where winter prevails during the height of this fruit's season.

This rhubarb is very easily grown. The roots instead of being chunky like the old variety are long like the parsnip and grow from 12 to 18 inches in length. Young plants about the size of a penholder set out even as late as July, if properly cared for and cultivated, will come into bearing by Christmas. The plants usually send forth from six to ten crowns, but frequently make many more, and as fast as the stems are pulled others take their places. They are at their best from October till June.

Although the plant is everbearing it is well to give it a rest during midsummer if a heavy crop is desired during the fall and winter. The stems can be used at all seasons, and the sauce, like that of the apple, possesses the great merit of being always welcome, having a peculiar flavor of which one never tires. It can be used as a standby at all seasons of the year. A fruit so highly appreciated in a country like California, where fruits are abundant at all seasons must be hailed with delight in those regions where winter reigns many months in the year, and where the delicious products of California's sun-kissed orchards are hailed as welcome visitors.

Crimson winter rhubarb will grow in any good rich soil and requires no fertilizer. It takes from 3,000 to 4,000 plants to the acre, and after becoming established requires water but three or four times during the dry season. To make a success of this plant financially it should be grown in such quantities that it can be shipped by the carload. There is not only the home market to be supplied, but the shipping market is always hungry and can be relied upon as a regular outlet for an immense product. The cultivation of this new wealth-producer is an occupation in which any intelligent energetic woman can succeed, and I hope in the near future that women, realizing the handsome profits and healthful work connected with its cultivation will be leading in the industry and growing hundreds of acres of this rhubarb. I know of no product the ground can produce that will yield greater profit with less labor and in a shorter period than crimson winter rhubarb.

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(THE STATE CENTRAL ORGANIZATION)

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1905

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"FOR THOSE WHO DESIRE THE BEST THERE IS IN LIFE."

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THE CALIFORNIA PROMOTION COMMITTEE

25 NEW MONTGOMERY STREET

SAN FRANCISCO

LOGGING REDWOODS, EUREKA, HUMBOLDT COUNTY, CALIFORNIA

The Lumber Edition

NO INDUSTRY in California holds more of interest to the general public, presents wider scope for investigation, gives surer returns of profit on money invested, than the lumber industry.

With thousands upon thousands of acres covered with virgin forest, some dating its origin back into the dim vistas of time whose archives tell the story of prehistoric man, there is no other State in the Union, and, indeed, no country on the face of the globe where is presented so intimately intertwined romance and commerce, as is to be found on the Pacific slopes of the Sierra Nevadas, within the confines of California.

There is much beside the mere cutting of timber and sawing the huge logs into lumber, to be considered, when taking a comprehensive view of the great forests of the Golden State. Promiscuous cutting means devastation, destruction and future dearth. The proper conservation of the forests of California has received the attention of strong mentalities, and of these that of Professor Gifford Pinchot, of the National Department of Agriculture, is conspicuous. In this number he has contributed an article on "The Forest Reserves and Their Object," and in it he gives a clear and comprehensive idea of the subject.

Following in the same line State Forester E. T. Allen has written of how owners can co-operate with the State in the matter of forest protection, and he gives some timely advice on protection from fires, and from the needless destruction of the magnificent forests of the State.

J. F. Nash presents a new theme in his article on "Lumbering on a Scientific Basis," and in it he tells the story of the coming out from the old days when the ox and the mule helped the lumberman, to the present when high grade machinery is used and long steel ropes wind their sinuous way through the forests to draw the immense logs to the mills.

"California Redwood," that most unique of all lumber in the whole world, is told of in a most interesting article by E. C. Williams, the pioneer lumberman of the State, who has watched the industry grow from its infancy. This article brings out many interesting points, not only about the lumber industry itself, but about these mysterious trees, relics of a by-gone age.

The pine industry of California, second in importance to that of the redwood, is treated of in an article by Clarence E. Edwords, and in it he gives vital statistics and records relating to the growth of this most important field in the lumbering interests of the State.

To the tourist and prospective settler coming from the other side of the range there is nothing more striking than the graceful eucalyptus, whose symmetrical form is to be seen rising on all the hillsides where man has his home. But in addition to the beauty and grace possessed by this tree it has a commercial value in that it is rapidly taking its place in the front rank of the hard woods of the country. On this phase of the eucalyptus George O. Brehm has written, giving much interesting information.

Taken as a whole the present number of "For California" is one which is of interest to the practical lumberman on account of its technical accuracy and to the general reader because the articles depart from the usual dull and statistical reports found in subjects of this kind. Something of the life of the tree, the free swing of the open, the breezy sway of the lofty boughs have been brought out in the articles presented, and one feels a closer kinship to the outdoors of California after reading them.

Forest Reserves—Their Object

By GIFFORD PINCHOT, United States Forester

THE need and use of the National forest reserves are best understood in the light of our country's rapid industrial growth.

Economy is the characteristic virtue of maturer age; extravagance the most familiar of the faults of youth. The same is true of life of countries; a youthful land takes but scant thought of the morrow, and spends its riches freely in its careless confidence and strong hope. It was not the conservative caution of the colonists that so rapidly made possible independence of the mother country, but it was their sturdy self-reliance and unsparing energy, which placed every natural resource under tribute and created riches. The symbols of their work and mission were the rifle and the woodsman's ax; the one to assert mastery over living creatures, the other to conquer the forest. The rifle protected the home; the ax built it of hewed trees and made about it a clearing on which to raise the crops.

In the early struggles of the colonists the forest was an enemy to be fought. A little later it took on the shape of a barrier to westward expansion. Generations were necessary before it could become what it now is, a commercial resource whose products rival in value those of the farm and of the mine. But the forest resources of our country were not limitless. Their measure, long so vague and apparently still so vast, may yet be taken. The striking rise in stumpage prices, now generally familiar, and the steady, though less conspicuous, rise in the prices of wood products, are sure signs that the forest is being overtaxed, utilized beyond its yield. The time has come when the unrestrained and wasteful use of the forest, if pushed much farther, must make certain the dangerous depletion of our forest wealth.

The purpose of the National forest reserves is three-fold, embracing the needful control of stream-flow, grazing and timber supply. The relative importance of these considerations varies with the economic role which the reserve plays in the region in which it lies.

One of these objects is to insure, by timely economy in the administration of the forested public lands, a perpetual supply of timber for home industries. While it is fully understood that by far the greater part of our forest land is now and will remain in private hands, it is of the utmost importance to preserve by wise use those public forests which still remain in the hands of the Government.

Not a little misconception on the part of the public followed the inauguration of the Federal forest-reserve policy. When the first reserves were proclaimed, the idea very widely prevailed that they were to be, as it were, locked up; that a reserve forest was not for use, and that the growth of communities near them would be hampered by lack of wood for their needs. The West, particularly, was alarmed, believing that its development was threatened. It is true that this opposing sentiment was not always disinterested or sincere. The Federal laws for the encouragement of settlement offered loopholes through which many claims were successfully made in violation of their spirit. By those who had selfishly taken advantage of these too lax provisions, or who hoped to take advantage of them, all measures in favor of the common good were naturally fought. But there did exist a good deal of honest misapprehension, which only time and a better knowledge of the true reserve policy could remove.

A second object of the reserves is the preservation of the forest cover where it is needed to regulate the flow of streams. Many of the reserves lie about the headwaters of streams which supply large areas with the water needed for irrigation. This is true, for instance, in marked degree of California. Fortunately, but little argument is necessary, where irrigation is the condition of prosperity, to prove the need, the priceless value, of the

forest reservoir. Those who live in regions where the denudation of mountain slopes has brought alternating flood and drought, have seen with their own eyes, and learned perhaps by their own bitter experience, the ruin which comes with destruction of the forest there. The indispensability of the forest for the sustained flow of streams is therefore well understood; it is probably the best known and most keenly appreciated of the reasons for the maintenance of forest reserves.

The third purpose of the forest reserves is the protection of local residents from unfair competition in the use of forest and range. As regards demand for timber, the forest administration studies the needs and rights of the small user and aims to protect him to the full extent of the law. It is with this purpose that the Secretary of Agriculture, at his discretion, permits the sale by Forest Rangers and Forest Supervisors on the ground of such small quantities of wood as residents and settlers may need in addition to the wood to which they are entitled under the provisions regulating free use.

As regards the range, the regulations in force are designed to encourage the conservative use of the forest pasture by those who are dependent upon the livestock industry. Overstocking the range, and grazing at certain seasons of the year, are forbidden, not to restrain this industry but to insure its proper growth and its permanence. This fact is well understood by a majority of livestock owners. Those who raised a clamor against all regulation of grazing on the reserves did so in most cases from misapprehension or from lack of foresight. Misapprehension prompted them to oppose any limitations of their own grazing customs which might favor the competition of other owners; lack of foresight prevented their realizing that misuse of the range must speedily put an end to the livestock industry. Happily, however, a better understanding already prevails. In general, the restriction of grazing on the reserves under a permit system, within the limits which the safety of the forest and its healthy reproduction prescribe, is heartily desired by the owners of livestock, because they see that it is for their best interests and their business welfare in the long run.

Grazing on the reserves is regulated by permits, granted to actual owners of stock. The reserves on which grazing is allowed will be divided into districts and such range divisions will be made among applicants for the grazing privilege as appear most equitable and for the best interests of the reserve. The leading objects of the grazing regulations are: The protection and conservative use of all forest reserve land adapted for grazing; the best permanent good of the livestock industry through proper care and improvement of the grazing lands; and the protection of the settler and home builder against unfair competition in the use of the range.

The new rules for the use of the forest reserves, which were issued by the Secretary of Agriculture on July 1, are designed to open the reserves to freer use. The people of the West, who have felt the need of them, have welcomed them heartily. At first, the law authorized the mere creation of reserves, and made no provision for their administration. Those local interests which depended upon forest resources could not fail to find this state of things annoying, and at the request of the Secretary of the Interior, the National Academy of Sciences recommended a national forest policy. The Act of June 4, 1897, followed, under which, with several later amendments, the reserves are now administered. The Act of February 1, 1905, transferred authority over the reserves to the Secretary of Agriculture, providing, at the same time, for the consolidation of the various branches of Government forest work, which until then had been divided between the United States Geological Survey, the General Land Office, and the Bureau of Forestry, not the Forest Service. The Secretary of Agriculture now has entire jurisdiction over the forest reserves, except in matters of surveying and passage of title.

It has therefore become possible to introduce scientific methods and a technically trained force in solving the complex problems arising from the necessary use of forest and range. As soon as the forest reserves were

transferred to the care of Forest Service, work was at once begun to bring the forest into larger use. More authority was given to the forest officers on the reserves, so that settlers entitled to the free use of timber, as well as those wishing to purchase timber in small quantities, might be served on the spot without delay. Whenever timber is wanted on a larger scale, experts are assigned to report on the advisability of a sale, and where large transactions are in due course completed, the timber is removed under contracts which provide for a second crop by fixing a diameter limit, by the marking of the trees to be cut, by careful logging methods, and by burning the slash to prevent fires. Twenty-six Forest Assistants, assigned as technical assistants to forest Supervisors, are at present engaged in the making of working plans. Forest Inspectors inspect and report upon all the work done on the reserves.

Besides these technically trained foresters there are also employed forest supervisors, rangers, and guards. To these men is given general administration and care of the reserves. They must know their regions, be familiar with local conditions, and combine good sense, independence, and the physcal, mental, and moral qualities which make good woodsmen.

Under the present scheme of administration all timber on forest reserves which can be cut safely and for which there is actual need is for sale. Applications to purchase are invited. Green timber may be sold except where its removal makes a second crop doubtful, reduces the timber supply below the point of safety, or injures the streams. All dead timber is for sale.

California's Pine Industry

By CLARENCE E. EDWORDS

OF THE $9,000,000 worth of lumber cut in California each year $4,250,000 worth, or almost one-half, is of pine. All along the slopes of the Sierras looking toward the rolling Pacific Ocean, extending north from Sanger to the Oregon State line stretch the great pine forests of California. From an altitude of 3,000 to 7,000 feet this magnificent timber flourishes in its virgin simplicity—the only virgin soft white pine supply left in the whole country. There is some white pine in Mexico and some in Canada, but California holds practically all that is left in the United States.

California pine embraces two kinds, known here as "white" pine and "sugar" pine. The sugar pine of California receives its name from the fact that there appears on the lumber a white fuzzy substance resembling sugar. This sugar pine is conceded to be equal to the best Michigan pine, and is fast superseding the latter in the Eastern markets. There is always, in the minds of the old lumber users of the Eastern States, an idea that there can be nothing "just as good" as Michigan and Wisconsin pine, and from this mistaken idea comes the fact that in Eastern markets California pine of the best grade sells for about $10 a thousand less than the same grade of Michigan pine.

About fifty saw mills, large and small, are steadily eating away at the forest of pine of the Sierra slopes, but with an output of 350,000,000 feet a year it is estimated that at the present rate it will take fifty years to cut the standing timber, and that estimate does not take into consideration the fact that the standard is so high that new trees are coming into use each year. While the Eastern standard is a six-inch butt that of California is sixteen inches with from two to three twenty-foot lengths. It must be confessed, however, in this connection, that the sixteen-inch standard is not always adhered to, and many of the mills are now cutting trees with twelve-inch butt. Even at that standard it will be many years before the slopes of the mountains are denuded of their pine forests.

The use of California pine has gone forward by leaps and bounds since shipments began going East a few years ago. In 1901 the price of the upper grades of California pine ranged from $26 to $30 a thousand feet.

but the demand has grown to such magnitude that the prevailing price for the same grades of lumber range from $40 to $45 a thousand.

When the first shipment of California pine went East to compete in the Eastern markets with what was then termed by the trade "Chicago" pine, it was a venture that was looked upon askance by all dealers in lumber, but the venture was not a losing one, and it took but a little time to convince Eastern contractors that California pine was equal to the best in the market for all uses to which soft timber is applied.

Michigan and Wisconsin pine, or as it was called because it came from the big city by the lake, "Chicago" pine began to take a back seat in the Middle West market and California pine, both white and sugar, crept steadily forward until it encroached on the market in New York. There, to-day, its sale goes steadily on alongside the best of lumber in that market. Michigan pine of the best grade sells in the New York market now at $80 a thousand while California pine, of the same grade brings only $70. There are two reasons for this discrepancy in prices. There are many contractors who hold to old fashioned ideas regarding lumber, and because they were raised on Michigan lumber they cannot get over the idea that it is the best in the market. This feeling in favor of Michigan and Wisconsin lumber causes more of a demand for that class. The second reason lies in the fact that Michigan lumber can be laid down in New York within a week after the order is placed. California lumber cannot be got across the continent under six weeks, and this necessitates a longer outlay of capital and a long delay after the orders are placed. In getting the California product it is necessary for contractors to look far ahead and place their orders long before they need the lumber.

California pine is especially adapted to use in fine interior work and pattern stock, and is becoming more and more in vogue every day. In store fittings, where a delicacy of finish is required, and in interior ship work where a fine appearance must be maintained white pine and sugar pine are especially fitted. First grade stock is used in all such work. Pattern stock requires an especially fine grade of lumber for foundries must have accuracy and permanency as well as softness. In the cabin and other interior work on ships and steamboats, pine is especially adapted on account of the fact that for sanitary reasons there must be frequent painting, and pine holds the paint much better than any other wood.

The sash and door factories of the country take the intermediate grade of pine, and most of this is shipped East on account of the fact that there are few factories in California. The big factory at Oakland is about the only one of importance in the State. There is a big future to this industry on the Pacific Coast.

There is to-day probably no more profitable field for the investment of capital in California that will bring the best and surest returns, than that of the manufacturing of lumber. There is not one in the State that is not running to its full capacity all the time to supply the demand which increases every day.

While the whole world is the market for California lumber and its products, the output of pine from this State is so thoroughly demanded by the necessities of American builders that but an infinitesimal proportion of the whole is sent abroad. Probably 4,000,000 feet go annually to Australia, 1,000,000 feet to Europe, and about as much to all the other foreign countries while the Eastern and Middle States take the bulk of the higher grades that come from the California mountain side.

The transportation of this amount of lumber is simplified owing to the fact that nearly all of it is sent to United States points. This is shipped by rail entirely. The lumber going to Europe is sent by rail to Galveston, Tex., and there loaded on steamers which carry it across the Atlantic. The Australian shipment is loaded on ships at San Francisco and Oakland and sent direct to its destination in the antipodes.

Very little of the lower grades of pine lumber is shipped from California. This is utilized largely in the making of boxes. Some of the box shooks are now being shipped to the Eastern market, but this has not yet reached the proportions of the trade in higher grade lumber itself.

Forest Protection

By E. T. ALLEN, State Forester

ALTHOUGH California has timber resources of vast extent and variety, probably no State has greater need of forest protection. This is true not only because their very extent tends to prevent any feeling of alarm by the present population, but because local conditions result, to a peculiar degree, both in making almost every industry dependent upon the forest and in subjecting the forest to unusual danger of destruction.

It is the just boast of the State that it is an independent commonwealth, able to produce all it consumes and more. This proves the interdependence of local interests quite as positively as it does their variety, and consequently that none can be developed at the expense of the others without ultimately injuring its own welfare. Were there only one or two large industries to which forest maintenance is essential, it would still be a matter for State concern. As a matter of fact, nearly every one is not only sympathetically, but directly affected. An available timber supply, protection to peculiarly exposed property, and a market maintained by a healthy condition of all lines of business, are all three nearly equally essential to the lumber industry. Agriculture in California, as a whole, is not only affected greatly by the prosperity of local consumers and by the price of lumber and wood for domestic purposes, but is absolutely dependent upon irrigation and hence upon forest-covered water sheds. Mining requires both timber and water; stock-growing depends upon the range—a forest product; and the business of every town and transportation company shares directly in the forest revenue. Nor should be omitted the business and pleasure derived from summer travel to the woods, nor the part the latter play in safeguarding the valleys against destructive floods.

But although California's future prosperity is so directly measured by the permanence of its forest resources, the difficulty of preserving them is equally intensified by local conditions. The thoughtlessness of an immense and increasing army of campers, the carelessness of sheepherders, the brush-burning proclivities of irresponsible settlers, and the penny-wise economy of many lumbermen; all these reach their height in this State, and combine for the most effective destructiveness with a climate of eight or more months without rain. Add to this the wasteful lumbering usual in a new timber region, here made habitual in too many instances by a period of indifferent transportation facilities and uncertain market, and continuing after these causes disappear, and it is not difficult to account for the truly alarming increase of the denuded area and decrease of summer stream-flow beyond all proportion to the output of forest products which alone could be their justification.

The remedy for this evil lies mainly in the hands of the California lumbermen, not because they are more guilty than other classes, but because they have greater opportunity and influence to secure its application, and, since they are most vitally interested, can best afford to make the exertion. They comprise the dominant interest in the regions chiefly affected, and, if they would, could control the situation very effectively. It is for this reason, in my opinion, that the usual appeal to them is misdirected. Forest enthusiasts are too apt to insist that the lumberman adopt cutting methods not practicable under existing conditions, and to forget that he can, practically, render even more valuable co-operation through the fire laws. Of his two possible fields of protective work—the general prevention of fire, and personal adoption of conservative cutting methods—I consider the first the most urgent by far, for without success in that he cannot afford to try the other.

The first duty of the lumberman, then, should be active co-operation with the State in enforcing its fire laws. The last Legislature enacted ex-

cellent prohibitive sections, but contemplating a strictly co-operative system, did not provide for their enforcement at State expense. To make them effective there must be a force in the field, and under the law, this must be paid from county or private sources. The State can authorize, empower and assist, but cannot pay the bills. There should be men in every timbered locality with power to enforce the laws, to control the use of fire, and to take immediate steps to extinguish the fires which start in spite of all preventive effort. These men may be employed by timber-owners or by the counties as specially provided by law. Certainly the lumbermen who pay a large share of the taxes, are entitled to this protection in return, and there is no reason why they should not have it. I cannot emphasize too strongly that energetic pressure upon the county Boards of Supervisors for co-operation with the State under the new laws will bring protection from fire; and that, inversely, lack of interest shown by lumbermen certainly will mean failure by the counties to take such action. Nor is it an expensive measure. One man for patrol during the dry season, with a few scattered assistants among the residents who are paid only for the days they work and are on the spot quickly when needed; all of these empowered by the State to arrest for violations, to call out assistance for fire fighting, and to grant or refuse permits to burn brush, will give a large district very efficient protection for a few hundred dollars a year, and even where the county cannot be made to see the value of such an investment, the property-owners themselves can pay for no cheaper insurance.

So much for public effort, which is the most urgently needed. Second in importance is the conduct of lumbering itself, and here again fire prevention should precede other means of preservation. The methods are subject to local variation and to the scale of operations, but in general they should include the annual burning of slash to prevent dangerous accumulation, done so as to protect the young growth and at a time when fire will not spread to the woods, the use of spark arrestors on engines, the clearing of fire lines where practicable, systematic local patrol, sometimes assisted by telephone construction, prompt extinguishing of all small apparently harmless fires which await only favorable weather to become dangerous, and above all, abandoning the frequent practice of purposely firing standing timber to destroy undergrowth.

The foregoing reforms are needed everywhere, if the process of changing forest wealth into worthless and even more inflammable chapparal is to be stopped from its alarming acceleration throughout the State. More local in its aspects and difficult to discuss briefly, is the problem of applying conservative cutting methods. The logging of mature timber only, with a view to a second cut when it shall be needed; conservative cutting so as to leave the ground salable to the Government for reserves or to other investors in timber of future value or for certain purposes; regulation of cutting to the mill output so as to deplete the stand the least; cutting so as to insure reproduction; all can, under favorable conditions, be as profitable to the lumberman as they are desirable for economic reasons, but they are all questions for study on the ground in each particular case. The owner who is willing to consider them will receive every possible help from the State Foresters and from the Federal Forest Service. Upon request, practical foresters, familiar with California conditions, will consult with him and study his tract, and prepare plans for both fire protection and cutting if they find these practicable. The assistance they give is not theoretical, but based upon actual experience and results in similar work with lumbermen throughout the United States.

To sum up, for the first time in California there are means by which the lumbermen can receive the legal and advisory support necessary to enable him to make his industry a permanent one. It rests with him whether he makes the most of the opportunity and at the same time confers an incalculable benefit upon the State for all time.

Lumbering on Scientific Basis

By J. F. NASH

TO one not familiar with the lumber industry, the progress in scientific lumbering during the past twenty years must indeed appear marvelous. But to him who has been close to it, it has been simply a process of evolution, step by step, from one improvement to another, and has caused little more wonder than the growth of a child. Yet when the writer looks back to the time, some twenty years ago, when first employed in "the woods" by one of the most progressive lumbering concerns in California, and reviews the advances made up to the present, he realizes that in few other lines of industry has there been more progress than in scientific lumbering.

Even then the horse team had begun to supplant the "plodding ox," whose death knell was soon sounded by the whistle of the logging donkey. This was at first the old upright spool engine upon which a two-inch hemp rope was used for hauling in the logs. The fact that this rope was costly and short-lived suggested the use of the wire cable, which has since been so improved that now it is practically as pliable as hemp, and, on account of its durability, is much cheaper. This is important, as the cable is one of the chief items of expense in present day logging. In spite of all of the arguments of the "bull-punchers," these donkeys were a success. Soon the stress of keen competition, and the active mind of the logger, who is generally a specimen of good mentality as well as of fine physique, evolved the "bull donkey," a machine that would haul a larger load a greater distance and at less expense.

It was a far cry from the first "bull," which was a composite of several old engines, and would haul logs only one thousand feet, to the present powerful, yet symmetrical and compact machine that carries from a mile to a mile and a half of cable. However, it has still been found necessary to use smaller engines for the purpose of "yarding" the logs to the "bull donkey's" cables, and these have been so improved that their speed and strength have been doubled, thus doubling the hauling capacity.

A like improvement is noticeable in the iron blocks used for directing the cables so as to avoid rocks, trees, stumps and other obstructions, and in the cross-cut saws and axes employed in falling timber, the crescent-ground, thin-backed saw having supplanted the old-time thick-backed saw, and the double-bitted the old-style pole axe.

Logging railroads with powerfully geared locomotives and strongly built cars have taken the place of the cumbersome wooden-wheeled logging trucks of old. Coming to the mill, we now have the millpond, wherein the logs are cleaned and sorted. A new appliance, recently installed in one of California's most progressive mills, picks up the "sinker" logs with grappling hooks and conveys them by means of an overhead cable trolley to the slip or chute at the mill, where they are placed on the endless jack chain, a successor to the old car and cable system of raising the logs into the mill; are carried to the log deck and lifted out of the chute by patent machines called kickers, and rolled against flippers or deck stops, which hold them in place until ready for the carriage, when by a simple movement of a lever, operated by the foot, the first log is released and the next one is held in place until wanted. This work was formerly done by several men with peavies.

After being released by the deck stops, the log is seized by the "nigger," an almost human contrivance for placing and turning the log upon the carriage. Probably the most remarkable improvement is noticeable in the construction and operation of the carriage used for conveying the logs to and from the saws. This is a development from the old slow rack and pinion "feed" to the present "shot-gun" feed, and from the hand-set to the steam-set, operated with almost lightning rapidity.

The circular saw has given place to the immense band saw, which latter has been so improved from time to time that it is now a marvel of mechanical ingenuity. From the time that the lumber leaves this saw and

passes—practically without the aid of human hands—over the live "rolls" to the gang saw, or to the edgers, through the trimmers, where each piece of lumber is squared and cut to the required length, and thence to the "sorting" table, vast improvements have been made in the recent past.

At the sorting table each dimension is taken off at its proper truck or car, and thus the lumber is sorted into uniform sizes for immediate shipment on the railroad, for piling in the yard for air-drying, or for placing in the kilns for quick drying. In this latter process the improvements and labor-saving devices have been too great even to touch upon in a brief article.

From the dry kilns the finished product is diverted into many channels, as at the match company's plant at Barber, Butte County, where have been erected, and are in process of erection, a planing mill, a box factory, a sash and door factory having a capacity of one thousand doors per day, and a match factory. A pulp mill and other factories are in contemplation. A new feature of the lumbering industry in California introduced by this company is the installation of a fully-equipped foundry, machine and repair shop, where all manner of logging and saw-mill appliances are made and repaired.

Through the many manufactured products of her abundant forests, California is now securing much advertising; much greater will be this heralding abroad when matches from California are placed on the market. For there is no article more universally used than the match, and from this small but useful convenience we expect much in the way of making known the resources of our great and glorious State.

Practical forestry also is now being considered as a factor in scientific lumbering. The "prevention" of fire is the prime consideration, and to this end every precaution is now being taken.

The latest scientific methods are now being used by one of California's largest lumbering concerns. It has established an observation station on an eminence six thousand feet in elevation, which commands an unobstructed view of its entire tract of timber. This station is connected with a telephone system extending throughout the operating camps. The observer at this station is one who is thoroughly familiar with the tract, and who, upon discovering a fire, can locate it at once and thus direct the fire fighters whither to go. This will be appreciated by any who knows how difficult it is to locate, or sometimes even discover, a fire, when surrounded by heavy forest.

Logging locomotives are now fitted with oil-burning apparatus, and many fires are thus prevented that would otherwise be set by sparks if wood were used. Logging donkeys have close-meshed bonnets on their smoke-stacks, and the engineers, and in fact all employees, are instructed to be at all times careful and watchful for fires.

Short-cut trails have been constructed, radiating in all directions from the headquarters camp, so that when a fire is reported, it can be reached with the least possible delay. Fire-fighting tools, consisting of heavy iron rakes, long-handled shovels and axes, all painted red for purposes of ready identification, have been distributed to the different camps and stopping places along the main wagon roads and trails. Range riders are also employed, whose business it is to see that no depredations are committed by thoughtless persons.

Eucalyptus as a Hardwood

By GEORGE O. BREHM

ALTHOUGH the eucalyptus is a valuable tree when used as a forest cover, as wind breaks, as shade trees, as a source of honey or of oil, or for sanitary purposes, it is as an important commercial wood that it is to be most useful in California. The attention of lumbermen has of late years been drawn to the eucalyptus as a source of supply for hardwood to take the place of the Eastern hickory and oak, the supplies of which are rapidly becoming exhausted. Numerous varieties of

eucalyptus have been used for many years in Australia, their native home, as the chief source of hardwood timber. The uses of eucalyptus are many and diverse. It enters into the construction of buildings, ships, bridges railroad piers, telephone lines, fences, paving, vehicles, agricultural implements, furniture, barrels and numerous other articles. Having then so many and varied uses, the eucalyptus, which flourishes better in California than in its native home, is destined to occupy an especially important place amongst the timber products of California.

For the eucalyptus can be grown as any other crop. The common blue gum, which is the foremost commercial variety, is the fastest growing tree in the world. In a grove in California set in 1885 and cut for fuel in 1893 there were, seven years later, some trees two feet in diameter and more than 100 feet high. Other trees 25 years old have attained a diameter of six feet in California. Groves of blue gum when six years old will yield from 50 to 75 cords of four-foot wood per acre. Indeed, the possibilities of this wood are so great that the United States Forest Service is taking up the work of forestation in co-operation with the State of California. Planted close enough to develop forest conditions the eucalyptus will take care of itself. Even in soil too poor for cultivation forests can be reared easily and cheaply, bringing returns three times as soon as that of any other hard wood. The ratio of growth is well illustrated by the fact that the blue gum will attain in 24 years the diameter that it will take an oak over two hundred years to make. There is much land in California now considered too poor for growing any crop, that could profitably be planted to eucalyptus for fuel purposes the return from which would fully justify the planting.

So much for the possibilities of rearing eucalyptus forests. There is already a large and valuable supply of this timber extending throughout California from east to west, and from south almost to the northern limits. It is now used more largely than any other wood in California for fuel purposes, but is becoming recognized as too valuable to be used as such. In the Santa Clara Valley is a large establishment devoted exclusively to the manufacture of articles from eucalyptus. It is the best known wood for the manufacture of insulator pins for heavy transmission electric power lines; all parts of wagons and carriages are made from eucalyptus as well as the wood work of agricultural implements and carpenters' tools. The proprietor of this establishment who has had 15 years' experience in working with eucalyptus pronounces it as good as the best hickory for these different purposes.

The severest test of strength and endurance that any wood is called upon to stand has been successfully withstood by eucalyptus in its use as trip-hammer bars. These automatic hammers, whose heads weigh 200 pounds, have broken the best hickory obtainable while eucalyptus has stood the test. In the preliminary tests of strength made at the University of California with green wood grown on the campus the strength was proved to be equal to that of hickory or oak. Tests of seasoned timber are not yet complete but will show much higher results. With the falling off of hardwood supplies in the East the prices have correspondingly advanced and quality has fallen off. As eucalyptus is not friendly to bitter frost and extreme cold, California with her favorable climate will keep in the lead and is destined to furnish the future supply of hardwood in the United States.

Eucalyptus is specially adapted to the manufacture of piles on account of its long straight stem as well as its resistance to rot and to attacks of teredos and other marine animals. Blue gum piles last twice as long on the Pacific Coast as do those made from other woods. Whole piers in the southern part of the State are constructed of it. One man who has his eucalyptus forest as others have their orange groves and apple orchards, writes that he has sold from his grove nearly $10,000 worth of wood during the last ten years. The demand for these piles is now greater than the existing groves of eucalyptus can supply.

As a source of fuel the eucalyptus is especially valuable on account of its rapid growth—as mentioned above—as well as on account of its oily nature. One grower says that from 200 acres of eucalyptus set largely in

soil too poor for crops he can cut 1,000 cords of wood per year indefinitely. $2.50 per cord are received on the stump for the crop, thus showing its profitable return.

The eucalyptus is especially useful for sanitary purposes. When planted in low and poorly drained situations it removes stagnant water and purifies the soil. This property of this most useful tree has given rise to its name, "The Fever Tree" in Spain.

But of all the varied uses to which the eucalyptus in its many parts is adapted it promises to be most important from an economic point of view to us here in California as the future source of supply of hardwood on account of its rapid growth, the great strength of its timber, the fact that it is as easily seasoned as other hardwoods of its grade as well as its peculiar fitness to the climate of California. These facts all combine to assure a great future to this important timber.

REDWOOD, CALIFORNIA'S UNIQUE LUMBER

By E. C. WILLIAMS

UNIQUE in the lumber industry of the world stands California. She alone of all timber producing lands sends forth to the marts of the world the redwood. This newest of all lumbers comes from the oldest of all trees. It comes from a tree of a forgotten former era in the world's history. Standing alone of its kind, no living representative is to be found anywhere outside the borders of this State, where it has survived the cataclysms which destroyed all its fellows in the vast tracts of Norway, Sweden, Spitzbergen, on the European continent, and Alaska, Wyoming and Colorado on this. In those countries are to be found the fossils of the cretaceous period which show that at some former age the sequoia had its being elsewhere than on the Pacific Slope of California.

True there is a tree in Japan which claims kinship to the Sequoia, but the relationship, if any exist, is so distant that it would not be recognized by the lordly trees of the Golden State who rear their heads in the cloud, and send their roots into the soil of past centuries.

In a belt 300 miles long and twenty wide survive the forests through whose isles once roamed the prehistoric mammoth, the cave bear, and the three-toed horse. What stories could these trees reveal to the delver into the past were but the power of speech given, or better were it to say, could the language of their whispering tops be understood. Who can tell what has passed since the day when this giant of the forest started from the ground a bright green shoot? Nations have changed, dynasties have risen and fallen, human history and earth's geography have been as the rolling waves of the sea, beside the lives of these mysterious relics of the past.

Here dwells mystery. But the iconoclastic hand of man has torn the veil and commerce is driving back the shade into the regions whence it came, and sending to the busy haunts of man those patriarchs of the tree world with their traditions of the beginning of time.

Thirty-seven mills, cutting 375,000,000 feet annually, are eating their way into the heart of the great redwood forests of California, and the question is frequently asked: How long will it last? A bit of history may be the best answer to that question.

One big lumbering company, twenty-five years ago, thought it had all its timber cut, and began to look around for other tracts. That was a quarter of a century ago, and while the company is cutting more than twice as much lumber to-day as it was then the tract is not yet exhausted. Indeed conservative men have gone so far as to say that the redwood forests of California, at the present rate of cutting, will last fully 250 years. It is estimated that there is an average of 50,000 feet of lumber to the acre of redwood forest, but it must be remembered that some of these big trees contain even more than that amount. One tree alone had 66,500 feet cut from it.

One of the old stories told around lumbering camps regarding the

size of these big redwoods is that of a chopper who selected a tree and began work on one side of it. After he had been cutting for a week, he chanced to stroll around to the other side and there found a man who had been cutting for eight days on the same tree.

The real "big trees" of California are the Sequoia Gigantea, but they do not furnish the true redwood lumber. The gigantea wood is brittle and is not near so suitable for lumber as the Sequoia Sempervirens, from which the redwood lumber is cut. But the sempervirens is no infant in size, as some there are fully fifty feet in circumference, with tops towering 300 feet above the ground. When it is remembered that the bark on a good sized redwood is twelve inches thick, some idea can be had as to the dimensions of the tree proper.

These redwoods grow from Santa Cruz on the south to the Oregon line on the north, and as a rule are scattered in forests or groves, dotting the hills and mountain slopes with patches of vivid green against the prevailing brown. The greatest quantity is to be found in the northern counties of Sonoma, Mendocino, Humboldt and Del Norte, and it is here that the vast lumbering interests of the State lie, so far as the redwood is concerned.

Redwood, being a new lumber, has not yet won its way among builders of other States and other lands, but it is fast being recognized as one of the most stable of all timbers. Where it comes in contact with the ground, or with the weather there is no other lumber that can equal it for lasting quality. It may be said that the red cedar and the cypress are almost as good. Redwood, is practically indestructible in the ground, or exposed to the air. In the forest of Northern California lies to-day a huge redwood trunk which some ancient tornado sent crashing to the ground. On the fallen trunk is growing a spruce tree, thirty inches in diameter, and fully one hundred years old. This tree has grown on top of the fallen trunk, its roots dividing and extending down on each side of the prostrate giant, holding it in a living embrace. This fallen redwood tree is six feet in diameter, and notwithstanding the fact that it has lain for more than a century its wood is as sound as any of the recently felled trees.

This fact is sufficient evidence of the lasting quality. But there are other qualities which make this lumber as especially suitable for building purpose, not alone in California, but in all parts of the world and especially in the tropics, where the depredations of certain insects make house building something to be dreaded. The white ant, that terror of the tropical countries, and especially of the Philippine Islands, does not touch the redwood, and this fact has brought about quite a trade between California and the insular provinces for the purpose of making cabinets and boxes for the keeping of records.

What makes redwood especially suitable for building purposes, and for shingles is the fact that it is practically incombustible. To those who have used redwood for kindling this may sound as drawing the long bow, but as there is no pitch in redwood, it will not carry fire when there is the slightest moisture in it. For casing work for doors, for windows, and for all places where unchangeableness is a necessity redwood is the best of all lumber. When it is once seasoned it neither shrinks nor swells. It can be wet for weeks without the calipers showing the slightest change in dimension. This feature makes it especially adaptable for pattern work, as it neither warps nor shrinks and the iron moulder will always find his casting exactly of the proper size.

Its resistance to weather and the action of the elements makes it especially suitable for railroad ties, and thousands of acres of the timber are being cut for this purpose.

The bulk of the lumber cut is distributed on the Pacific Coast, but other countries are beginning to understand the value of the material, and already Germany and England are sending in large orders for it. Australia, the Sandwich Islands, and other parts of Europe are calling for it, and as it comes into general use it will vie with all other lumber in the market. So far the price has kept low, the average for this valuable product of California being $22 a thousand.

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HOG RAISING NUMBER

FOR CALIFORNIA

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THE CALIFORNIA PROMOTION COMMITTEE
SAN FRANCISCO

FOR CALIFORNIA.

DECEMBER, 1904.

Application Made at San Francisco Postoffice
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THE CALIFORNIA PROMOTION COMMITTEE

(THE STATE CENTRAL ORGANIZATION)

THE PURPOSE OF THE COMMITTEE IS TO GIVE TO THE WORLD RELIABLE AND UNBIASED INFORMATION REGARDING THE RESOURCES OF AND THE OPPORTUNITIES IN CALIFORNIA. FOR CALIFORNIA IS PUBLISHED TO ASSIST IN CARRYING OUT THE OBJECTS IN VIEW

CORRESPONDENCE INVITED

FOR CALIFORNIA

A MONTHLY PUBLICATION

"FOR THOSE WHO DESIRE THE BEST THERE IS IN LIFE."

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THE CALIFORNIA PROMOTION COMMITTEE

25 NEW MONTGOMERY STREET

SAN FRANCISCO

FEEDING HOGS SKIM MILK IN CALIFORNIA

Statements of Experienced Hog Raisers

THE following letters to the California Promotion Committee will be read with interest by those who wish to know about hog-raising in California, as they are from those who have had experience in the industry. Mr. Gordon, who is 80 years of age, has been in the "hog business" all his life.

HUENEME, Ventura County, Cal.

Gentlemen:

Your favor of recent date is at hand, asking to hear from me about hog raising. As I am now over 80 years of age, it is with a good deal of diffidence that I commit myself to writing.

I was brought up in the backwoods on the Ottawa, in Canada. I have been in the hog business all my life, and in my young days in Canada I was identified with that pursuit. Sixty or seventy years ago in Canada hogs that would weigh from 400 to 500 pounds would bring about 1 cent a pound more than a 200-pound hog. Now it is the reverse.

In California the pigs now that will weigh 200 to 250 pounds at six to eight months old will bring the highest market price. I think there is a great deal more money for the farmers to market them at that age than to keep them a year and a half and average 250 to 300 pounds. Now, what is needed to get the hog that makes the most pork in the shortest time? I think the nearest I know of is the Ohio Improved Chester, registered O. I. C. They are small-boned, low set, good eaters and mature early (they are not the Chester White). I send you the weight of two that I weighed to-day: One was farrowed four months and two days ago, 43 pounds; the other farrowed one month and one day ago, 21 pounds. I had my pigs all last summer on alfalfa and I gave them some carrots for a change. I took them in about four weeks before the State Fair and gave them grain to harden them for the long journey of over 500 miles; consequently they were in good condition at the fair.

There are very few of these Improved Chester hogs in this State, although they are numerous in the East. The most pronounced objection against these hogs here is that a white hog will not do well in the hot climate in some of the interior valleys. It is said that the sun burns them, and that when they are wallowing in the mire the

skin cracks and they are likely to get mangy. I have had my pigs for nearly three years and they are as clean to-day as they were when I got them from the East. I hose them and wash them and they like it, but I do not have a cesspool for them to wallow in. I will admit that they are a thinner-skinned hog than the black, but I think it pays to keep hogs clean as well as it does other stock. Ordinarily they are sadly neglected in this respect.

I would recommend that a white or black hog should have no mud hole to go into, and that stock-raisers would have a law unto themselves to that effect, for we all know that microbes and germs of all kinds breed in stagnated water. There originates the hog cholera, which spreads to clean hogs as well as those which are neglected. It is my recommendation that where hogs are grazing on alfalfa, as they do in California, or on other pasture, they have besides a drinking trough, another box or trough, say two feet wide and eight feet long and six inches high, for them to wash in and keep cool in. A pipe should lead the overflow out of the field where the hogs pasture. I have been in the butchering business for over twenty years in California, having always kept hogs at the slaughter house, and I do not remember that I ever lost a single hog.

I do not think that alfalfa can take the place of grain for fattening. It is good for stock hogs, but in my opinion it is too soft for good pork. As yet, however, I have not had much experience with alfalfa. I prefer cooking or steaming the feed for pen hogs. I do not crush the barley or wheat, but cook it with leavings of carrots or beets, and when it is well cooked they get all the nutriment there is in it. I prefer wheat to any other grain for fattening, as the hogs like it better than barley and they put on fat quicker. In many places in this State corn is high and it does not pay to use it.

ALEXANDER GORDON.

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The following letter is from Charles C. Perkins, who believes that "this State is as well adapted to hog-raising as any of the Eastern States":

SACRAMENTO, California.

Gentlemen:

In reply to your inquiry of recent date, will state first my belief, that, with similar care and equal knowledge, on the part of raisers, California is well adapted to hog-raising as any of the Eastern States. Alfalfa makes most excellent hog feed. I have no data from which to state how many can be raised on an acre throughout the year, but alfalfa makes a very thrifty growth, and no doubt an acre of good alfalfa would keep at least six head during the summer months, with some extra grain food during the winter.

When properly equipped for raising, there is money in them at 5 to 6 cents a pound for pork. I do not believe that if proper attention is given to the business any diseases would seriously interfere with the industry.

I believe that the Berkshires are the best hogs to raise, with Poland Chinas a very good second. I raise nothing but thoroughbred Berkshires for breeding purposes. With the right kind of attention the increase ought to net $50 per sow a year at least, and $100 at the most. I refer in this latter statement to purely fine stock.

CHARLES C. PERKINS.

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PRIVATE CAR OF THE QUEEN OF CALIFORNIA.

"Honor to whom honor is due. Juliana de Kol, 'Queen of California,' traveled from Denver to the World's Fair Cream and Butter Makers' Convention in her own 'sumptuously appointed private car' on the Rock Island Limited. Nothing is too good for a cow whose 'record' is five times her weight in milk in one hundred days. Owners of private cars, please notice."—December issue of "Everybody's Magazine."

* * * * *

[Ed. Note.—Madam de Kol made the continuous journey from California to St. Louis and return in her private car, which was attached to the overland passenger limited as a delegate from the California Promotion Committee.]

Raising Fine Bred Hogs in California

CHARLES D. PIERCE

I CONSIDER raising good pigs one of the most valuable adjuncts of the dairy business to-day in California. In other words, hog-raising here is, in my opinion, a "gilt-edge" proposition when taken in connection with the dairy business. At any rate, it is as sure cash as perhaps any other industry that I know of. The two leading breeds, I think, are Berkshire and Poland China, in the order named, but of course every one to his taste.

No product to-day in California grows into money faster than pigs. Our stock comes into maturity very early. California pigs have their young in the spring and fall, and it is safe to say that they have from eight to ten young on an average.

I calculate that they grow a pound a day. When a pig is six months old he should weigh 200 pounds, which is better than a pound a day. I have a boar that weighed 650 pounds at fourteen months old. A preferable weight for killing in California is from 180 to 225 pounds. Hogs of this weight seem to bring a better price and seem to be more desired by the butchers and by the public generally.

I feed my hogs mostly skim milk, with a little mill feed, corn, pumpkins, etc. Skim milk has a great value when it is turned into pork. It is the pig that makes it valuable, because unless fed to hogs one does not get much out of skim milk as a by-product.

I cannot urge too strongly the desirability of raising a good variety of stock. It costs so little to keep good stock and it is cheaper in the end. Indeed, the profit is many times greater. Thoroughbred pigs probably bring three times as much as those raised purely for the market, and yet there is big money in raising good stock for the market. It doesn't cost any more to feed a good pig than a poor pig. If you have a very scrawny, poor-bred hog, he will probably consume more food that the better-bred animal, and will not fatten so rapidly, as he does not assimilate his food as well as the thoroughbred hog.

On our Riverside dairy ranch we raise fodder corn. In the fall we let the cows in on the corn fields and they trample it down. The pigs are then turned in the field or the stubble is hauled in to them, and they eat it up clean. We do not allow our pigs to graze at large, as they fatten

more rapidly when reasonably confined. Many, however, let their hogs graze on alfalfa and find it a splendid forage. Though hogs can live in the open the year round in California, it is better to provide shade for them in summer, although their quarters need not be boarded up on all sides. The hot sun of some of the interior valleys is apt to make a big, fat pig uncomfortable.

Climatic conditions in California make hog-raising desirable. One can raise feed for them at all times of the year and they are not called upon to resist the bitter cold of the East.

* * * * *

MEETING OF COUNTY PROMOTION COMMITTEES.

An interesting meeting will be held in Pasadena on December 17, 1904. This will be the second semi-annual meeting of officers of the Chambers of Commerce and development organizations of California, the first having been held in Sacramento on June 18th last.

The theme of the Pasadena meeting will be "California Publicity." That this topic will be vigorously and enthusiastically discussed is assured by the fact that California is the only State where the members of development organizations have ever met with the common purpose of co-operation and bettering their work.

At the Sacramento meeting last June, which was the first of the kind ever held, a resolution was passed recommending that all the organizations in the various counties of California be formed into County Promotion Committees on a basis of equal representation, each organization appointing one or more of its members, according to the number of organizations in that county, to serve on the County Promotion Committee.

Throughout California these County Promotion Committees have generally been appointed. As they are now constituted, they bring all organizations in each county into close touch and they form a rational method by which all the organizations in California can work together for the development of the whole State.

Each County Promotion Committee representing, as it does, all the organizations in that county, is a unit in the united development work for the whole State.

The County Committees will assist the State Publicity Committee in its work of advertising the whole State.

An interesting program has been arranged, and as all members are invited to discuss the subjects assigned, it is believed that the Pasadena meeting will be a great success.

At the last meeting of the officers of development associations in Sacramento, June 18th, there were present delegates who had come 600 miles to attend the meeting.

* * * * *

NUMBER OF SWINE IN CALIFORNIA.

An expert estimate places the number of swine in California at 511,311, valued at $3,901,307, or $7.63 a head, slightly less than the average in the East and in Iowa, where hog-raising is an industry of tremendous importance. The value of swine on dairies in California is estimated at $1,710,040. A leading dairyman and hog-raiser for many years states that fully one-third of the hogs in California are raised on dairies. On this basis the hogs raised on dairies in California are therefore far more valuable than the general average of Eastern hogs.

* * * * *

PREMIUMS FOR "FOR CALIFORNIA."

For every new subscriber for "FOR CALIFORNIA" whose name is sent to the California Promotion Committee, San Francisco, we will send one copy of any of the following publications: "San Francisco and Thereabout," by Charles Keeler, or "California Addresses by President Roosevelt," containing in chronological order all the addresses delivered by the President while in California, or "California To-day." The volumes sent to any address postpaid.

Raising Swine for the Market

RAISING hogs for the market is an industry which should prove very profitable to thousands of Californians. There is good money in hogs in this State. Seven-eighths of all hog product, such as bacon, ham and lard, consumed in California is imported from the East. For this reason local hog-raisers have the advantage over Chicago prices, plus the price that is added by the addition of freight.

Despite the strong demand, California ranks but twenty-fifth in swine. On January 1, 1903, the last census of this kind, California had 511,311 swine, valued at $3,901,303, or an average price of $7.63 per head. For the seasonal year 1901-02, the value of hogs produced on dairies was $1,710,040.00, so that swine may be considered almost a by-product of the dairy. California ranks first as a producer of alfalfa, with about 410,000 acres of this splendid fodder, and this despite the fact that California is not a "short grass" State; that it produces other fodders in great abundance, and that alfalfa is not raised, as in many other States, to tide the stock over the winter. There is really no season in which alfalfa cannot be cut.

Alfalfa is a splendid food for horses, cattle and swine. It is equally good for sheep, but the sheep graze so close as to cut the roots, and consequently frequently destroy the plant. There is no cheaper or better way of producing pork than to allow growing pigs to run in a field of alfalfa. "One acre of alfalfa will furnish forage for from ten to twenty hogs per season," declares Farmers' Bulletin 31 of the United States Department of Agriculture. "At a conservative estimate, ten pigs per acre will gain 100 pounds each during the season from May to September, and 1000 pounds of pork cannot be produced so cheaply on any other feed."

This statement of the Department of Agriculture is endorsed by California breeders, with the comment that not only does alfalfa give a good forage from May to September, but it may be relied upon in California throughout the entire year.

A study of alfalfa has an important bearing upon swine raising, inasmuch as young hogs may be turned into an alfalfa field with absolute safety. This is not always the case with cattle, as they will sometimes get the "bloat" when turned into the green alfalfa.

Swine-raising is particularly attractive and

profitable in connection with dairies, as there is much waste from the dairy which makes a ready fattener for hogs. A herd of swine is the usual accompaniment to a large dairy, and there is no reason why hog-raising in this State should not be conducted on a basis large enough to supply completely not only the demand for dressed hogs, but for hog products, such as bacon, hams and lard. The swine supply raised in connection with dairying will steadily increase as the dairies themselves become larger.

Besides alfalfa, California has abundance of other fodder for swine. After the grain is cut, the stubble proves a splendid fattener. Hogs come from the great grain fields of California literally "hog fat." California bacon is "striped like the American flag," to use the words of a local dealer. It contains more meat and less fat than the Eastern bacon. Then, too, there are great stretches where corn is abundantly raised in California, and those who particularly desire to raise corn-fed hogs can do so to their heart's content. Take the moist lowlands from the valleys north of the Bay of San Francisco southward to San Diego. Here is raised the finest corn in the world. These valleys are near enough to the coast to catch something of atmospheric humidity from the ocean and still they possess summer heat enough to suit this warmth-loving plant. Corn reaches great dimensions in California, and while dry heat sometimes puts corn in distress which irrigation cannot wholly reclaim, there is much land in California where corn and corn-fed hogs can be raised.

Iowa is a great hog raising State but when its people talked with Mr. Geo. W. Pierce, who visited the East for the California Promotion Committee, acknowledged California gives greater profits on swine per head. Mr. Pierce found at Clarinda, Ia., farmers feeding their hogs $15 worth of corn to keep them alive during the bitterly cold winters and selling the hogs for $20, counting their time and labor for nothing. Yet California is buying Eastern swine and poultry at a cost immensely greater than we could produce the same here. The reason for this is that the people of Iowa and of the Clarinda section have learned the profits of hog raising. They apply themselves to this class of work and ship their products to California, notwithstanding the heavy freights.

What California wants is more hogs and more factories to treat hog products so that we will not have to import seven-eighths of our hams, bacon, lard and hog products.

* * * * *

"WHERE THEY WANT MEN"

"Out in California there is an organization known as the California Promotion Committee.

"The California Promotion Committee wants men, men who will cultivate small farms and raise the products of the soil.

"The California Promotion Committee out in California is composed of public spirited men. It is the central organization of 140 Chambers of Commerce in that State. Its funds are raised by subscription. It has nothing to sell.

"There are thousands of acres of fertile land in California that are unsettled. The California Promotion Committee wishes to bring the landless man to the manless land. It has received word from the owners of more than sixty huge ranches that they will subdivide for the benefit of incoming settlers. It would take a man half a day to ride across some of the big California ranches.

"The terms are reasonable. The land is cheap. In many cases work will be taken as part payment.

"Commissioner of Immigration Sargeant says a great many of the immigrants who arrive at Ellis Island with some money, fall the victims of sharpers, and eventually drift back penniless to the cities. These immigrants help fill the sweat shops.

"They would be more useful citizens if in the country.

"In California alfalfa grows green the year round. Already 350,000 acres are in alfalfa, and a million acres could be placed under cultivation. Farmers' Bulletin No. 31, of the United States Department of Agriculture, pronounces alfalfa the best natural forage. Cattle, hogs and stock of all kinds thrive on it."—From the "New York American" and "Chicago American" October 27, 1904.

The Brown Family in California

By JASON BROWN

CHAPTER TEN

ANENT RAISING PIGS

"STICK a pin in it," said Simpson, "and tack it over the mantel piece."

"Stick a pin in what?" I asked, amused by Simpson's queer phrase.

"That's just like you fellows," said Simpson, without answering my question. "You come way out here to California from your New England farm, and you're so used to cultivating rocks all the time and gathering a sure crop every fall and spring that you expect the California climate to do everything."

"Now, Mr. Simpson," said my Ethel, protesting, "here you are criticizing us New Englanders in California and we don't know what you're talking about."

"Pigs," replied Simpson, sententiously.

"Pigs?" we asked, all at once.

"Yes, indeed; pigs," said Simpson. "Hogs, or swine. It don't matter much by what name you call 'em. There's so many of the two-legged kind that sometimes it's confusing. But there's money in these same pigs in California."

"The four-leggers?" inquired Robert.

"Yes, Bobbie," said Simpson, "and I was just thinking that a sign with 'There's money in pigs' painted on it would be a mighty good thing for most of us people who are letting our chances go by, to stick over the mantelpiece. There are hundreds of carloads of hogs brought into California every year," continued Simpson, "to say nothing of hams, bacon and all sorts of hog products. I understand that seven-eighths of all the hog products consumed in California are imported, although the packing houses have a capacity far above the supply and are willing to pay their good money for all the hogs we will sell them."

"Why do you say we are letting our chances go by by not raising hogs?" asked my good wife. "Couldn't you say that of any profitable branch of farming which we neglect to take up?"

"It's just this, Mrs. Brown; I think everybody who has a few dairy cows makes a mistake if he doesn't keep hogs to consume the skim milk. Skim milk of itself has no value, but when it is converted into hog meat it turns into money. Now, you have a few pigs and you are doing well, but while I could easily keep a couple of hundred head of hogs on the Estudillo rancho, I don't do it. Why? Because I'm Simpson. I'm just Simpson, manager of the Estudillo rancho, and for twenty years I've thought of nothing but raising

grain on a big scale. I've bought my eggs, I've bought my butter, I've bought my bacon, and all because I've been in the same old rut that other people are and have thought it did not pay to raise these things.

"But now," continued our jolly neighbor, "I'm a-going to turn over a new leaf, and as soon as Bobby paints that sign I'll hang it over my mantelpiece, and everybody who comes in will see

"'THERE'S MONEY IN PIGS.'"

A couple of weeks after this conversation, while flooding our alfalfa patch, I heard a great squealing on the State road, mingled with the vigorous shouting of our friend Simpson. The only thing I could see was Simpson's bay team, but being a New England farmer, I thought I couldn't do better that to have a chat with our genial neighbor.

"Yes, Jason," said Simpson, as I approached, "I've turned over that new leaf and bought some hogs. There's forty of them in all, Berkshires mostly, and a tip-top grade of stock."

"Why did you buy so many?" I asked.

"Well, we've got more skim milk at the Estudillo rancho than we know what to do with and I'm going to turn it right into pork. I've got eight acres in alfalfa over there, and the patch will easily support these hogs. You know an acre of alfalfa in California will easily feed five hogs the year round. Some people claim ten or more hogs to the acre. But my hogs will have plenty of latitude and I will be able to fence off some of the alfalfa and cut and stack it while the hogs are grazing on the rest of the patch."

"Are there any special rules which should be followed in order to get the best results from feeding alfalfa to hogs?" I asked.

"Yes, indeed," said Simpson, "and the more you observe these rules the better results you are likely to get. The alfalfa in a hog pasture should be mowed down whenever it begins to get hard and woody. This will provide plenty of young and tender herbage, which is more nutritious, and if the swine are provided with this food in its most nutritious condition, their growth will be most rapid. The hogs ought to be provided with an abundance of fresh or running water in the pasture. This water should not be allowed to seep through the soil and reach the roots of the alfalfa, for it will destroy the plant. If a man uses care in this he will raise alfalfa with success and his hogs will be uniformly marketable."

"Is alfalfa such a good food for hogs?" I asked. "Back in New England we thought we couldn't fatten them without corn."

"That's just the point," said Simpson. "Hogs, of course, need something to vary their diet. Some morning you find that your old sow, who has just had thirteen nice little pigs, has eaten most of them up. Why? You say she's a cannibal. But the probability is that she didn't get a proper change of ration, and craving a different food—she don't know what—she just turned in and gobbled her own progeny."

"But alfalfa?"

"For the production of bone, muscle and stamina, alfalfa can't be beat. Alfalfa equals any forage and probably contains most of the desirable qualities for stock-raising that are found in all other of the well-known forage plants combined. Where pigs can get sweet milk such as I am going to give these fellows here, from the separator, it is not unusual to find representatives of the best breeds weighing 250 pounds at seven months old. In order to carry such weight at this age, the animals must have strong bones, stand on straight legs and possess great muscular power. Conditions in California tend to produce these qualities. Alfalfa makes the hogs strong and skim milk makes an admirable animal ration. A great many hog-raisers say that alfalfa is not in itself a complete ration. It is very rich in protein (I guess that's what they call it), and young pigs on alfalfa assimilate it more easily than any other fodder. It is transformed into blood, muscle, tendon and bone.

"I guess I've filled you plumb full of hogs and alfalfa, Jason," concluded Simpson, picking up a wisp of hay from the dashboard and chewing it with evident relish. "I'm an Encyclopaedia Brittanica and Webster's Dictionary all in one when it comes down to alfalfa."

"Bill Simpson," I said, "you're a jewel. But I'm not in the jewel business now and I've got to get back to my alfalfa field, or the water will be putting it out of business."

(To be continued in the January issue of FOR CALIFORNIA.)

Hog Raising in California

Professor E. W. MAJOR, Dean of the Bureau of Animal Industry,
University of California

Judging from the figures obtained in the last census, California is not producing nearly the amount of pork that the other States do, excepting, perhaps, those that are used almost entirely for range purposes. We find at the same time that we are shipping into the State a large amount of pork. Most of it comes in the shape of salted hams and sides. The Philippine trade has increased wonderfully during the last four or five years, and there is no doubt that our Eastern possessions will offer large markets to us in the future.

The reason why California has not gone more extensively into hog raising may be found in the fact that in the opinion of most people, corn and hogs must go together. This, however, is not true. Of course, we must allow that corn has a decided advantage when it comes to economical pork production, but it has the great disadvantage of reducing the fecundity and also weakens the constitution of breeding stock. We find that many breeders throughout the corn section are importing hogs from other sections for breeding purposes. Some go to the East and others cross to England so as to secure animals of stronger constitution and greater prolificacy. Why should not California compete for some of this business?

In the irrigation districts we grow large crops of alfalfa, and in other sections clover grows in great abundance. Many experiments have been conducted by Agricultural Experiment Stations to decide the value of these crops for swine-raising. In a recent report by the Kansas Station, it is shown conclusively that alfalfa, when supplemented by a small grain ration, has a high nutritive value as a feed for swine. The dairy industry is growing rapidly in all the irrigated sections and there is no other line of farm work that fits in better with dairying than hog-raising. By-products—skim milk and butter milk—furnish excellent feeding material both for the young pigs and those in the feed lot. Then, too, pigs will consume a large amount of the waste material that comes from the house. This, of course, must be fed judiciously, care being taken not to include any material that has decayed badly, or any wash water that may contain any of the various soap powders.

It hae been mentioned above that in feeding alfalfa, it is necessary to supplement it by a small grain ration. While we do not raise any great quantity of corn, yet we do grow large quantities of barley. The American pork-producer has not, in the past, relied upon barley to any great extent for hog fattening. The Danish farmer, when he is anxious to produce a particularly fine article, feeds barley, and the American feeder can well give this matter his careful consideration. Experiments that have been conducted in various Experiment Stations, particularly those in Canada, show that barley possesses a very high feeding value. One of the commonest complaints that has been made against California pork is that it is soft and slushy. The common cause of this is that we are feeding too much green feed and not enough grain or other concentrate. If we are to be successful as hog raisers, we must profit by the lessons we can learn from the corn-growing sections. They have developed an overfat type of hog from feeding too much corn and not enough of the nitrogenous foods. We must combine our foods so as to secure pork of the highest quality. A farmer who would go into hog-raising, however, as a leading feature of his farm work, or as supplementary to the dairy, should realize that, in order to be successful he must give the matter the same consideration that he gives to the other lines of stock-raising. The greatest losses in the hog business comes from neglect in providing sufficient shelter and water; from allowing infection to get into his herd, and then disease spreads rapidly. Hogs do not stand great heat nor great cold. They should, therefore, be provided with shelter both in the summer time and in the winter.

Care, too, must be taken in selecting the breeding stock, to see that the animals are of good constitution and of the type required in the breed. By doing this and using good judgment in feeding and management of the herd, hog-raising would be one of the most profitable of the livestock industries that the California farmer could engage in.

Hog Prices in California

THE following quotations from a San Francisco paper on last Thanksgiving Day may give some idea as to hog prices in California as compared to prices in the Middle West. In this connection it should be stated that the cost of raising hogs in California is less than in the Middle West. Another factor in hog raising in this State is that the price of hogs in California rises up to meet the Eastern price inasmuch as the demand in this State is less than the supply.

There is a good market for most descriptions of Dressed Meats and the prevailing prices are maintained with marked steadiness, prime offerings readily commanding the top range of values.

DRESSED HOGS—Per lb, 8@8½c.

Retail quotations for Meats as furnished by the San Francisco Retail Butchers' Protective Association, are as follows:

PORK—Loin Roast, 15@18c; Leg Roast, 12½@14c; Shoulder Roast, 10@12½c; Chops, 15@18c.

These prices do not cover the cheapest grades, as it is impossible to quote regular prices on them.

PRICES OF LIVE HOGS (CALIFORNIA BRED) IN CALIFORNIA.

Hogs rule firm at the revised figures and available supplies of desirable stock find a ready outlet at the top quotations. The demand for other kinds of Live Stock is spirited and the appearing prices are strongly held.

HOGS—Per lb: Hard grain fed, weighing alive 80 to 130 lbs, 4¾@4⅞c; weighing 130 to 250 lbs, 4⅞@5⅛c; weighing 250 to 350 lbs, 4½@4¾c; rough heavy, 3½@4c; common, 3½c.

PRICES OF EASTERN BRED LIVE HOGS IN MIDDLE WEST.

OMAHA, November 23.—Hogs—Receipts, 13,000; shade lower. Heavy $4.45@4.55; Mixed, $4.47½@4.52½; Light, $4.50@4.52½; Pigs, $4@4.40; bulk of sales, $4.47½@$4.52½.

KANSAS CITY, November 23.—Hogs—Receipts, 16,000; steady. Bulk of sales, $4.45@4.75; Heavy, $4.65@4.80; Packers, $4.55@4.75; Pigs and Lights, $3.75@4.60.

CHICAGO, November 23.—Hogs—Receipts, 37,000; Friday, 25,000; market, 5c. higher. Mixed and Butchers, $4.55@4.75; Good to Choice Heavy, $4.70@4.75; Rough Heavy, $4:45@4.55; Light, $4.50@4.65; bulk of sales, $4.60@4.67½.

PRICES OF PROVISIONS (HOG PRODUCT) IN CALIFORNIA.

HAMS—California, per lb, 12@12¼c; Eastern, 12½@12¾c; Picnic, 8½c.

BACON—Prices per lb: Sugar Cured Breakfast, extra light, 15½c; English Cured Belly, 6 to 12 lb average, 13@14c; fancy Short Backs, 11c; medium clear, 10½c; light medium clear, 10½c; selected clear, 11c; light, 12½c; extra light, 13c.

LARD—Prices per lb are:

	Tcs.	½-bbls.	50s.	20s.	10s.	5s.
California pure	9½c	9¾c	9¾c	9⅞c	10¼c	10⅞c
Compound	6 c	6¼c	6¼c	6⅜c	6¾c	6⅞c
Eastern pure	9½c	9¾c	9¾c	9⅞c	10¼c	10⅜c
Compound	6¾c	7 c	7 c	....	7½c	7⅝c

In 3-lb tins the price per lb is ⅛c higher than in 5-lb tins.

PORK—Dry Salted Clear Sides, 9½c; Bellies 10½c; Backs, 9½c; Pickled Pork, clear, bbl, $19; hf bbl, $9.75; Pig Pork, bbl, $22; do. hf bbl, $11.25; Soused Pigs Feet, hf bbl, $5; kit, $1.25.

PRICES OF DRESSED HOGS AND FRESH PORK IN CALIFORNIA.

DRESSED HOGS—Per lb, 8@8½c.

Retail quotations for Meats as furnished by the San Francisco Retail Butchers' Protective Association, are as follows:

PORK—Loin Roast, 15@18c; Leg Roast, 12½@14c; Shoulder Roast, 10@12½c; Chops, 15@18c.

HOGS FROM THE CALIFORNIA PACKER'S STANDPOINT

The opportunity for hog raising in California, say the dealers in swine and hog products, was never so good as it is to-day. In fact, there never has been a time that anywhere near the number of hogs was raised in California that the market demands. One large dealer in San Francisco states that fully 500 per cent more hogs than can be secured could be handled, for there are packers and slaughterers in this State equipped to handle hogs to as good advantage as some of the Eastern packers. With the increase in the supply there will be an increase in the facilities, although at present, as stated, the facilities and demand far exceed the supply.

The opportunity for hog raising must be considered from two points—that of demand and that of supply. That the demand is good is illustrated by the fact that during a year's period and every year 10,000,000 pounds of Eastern pork products are sent to San Francisco alone to make up the shortage of hog products in this State. One provision firm in San Francisco imported from the East over 3,000,000 pounds of hams, bacon and lard during the past year.

The question of supplying the market particularly affects the hog raiser. It is estimated that fully one-third the hogs now raised in California are raised on dairies. Hogs are a valuable adjunct to the dairy and skimmed milk can be turned to no better use than as a food for hogs. With the rapid development of the dairying industry in California and the supplanting of the "dairy process" by a more modern "creamery process," hog raising affords usually a satisfactory solution as to how the dairy man shall dispose of his skimmed milk at a profit.

In years gone by, when California (and especially San Francisco), was not equipped for the taking care of pork products as it is to-day, then Eastern pork products, cured in cold storage, were given the preference over California pork products. This gave the impression throughout California that the Eastern pork products were superior to Californian. To-day San Francisco, as well as other points, is well equipped for handling pork products. The Eastern products are cured in cold storage and it takes from thirty to sixty days to produce good ham and bacon.

California, with its resources for the raising of grain, were this grain put to hogs as Eastern farmers do their corn, would produce as good, if not better hogs than the East produces. Our hogs are fine-boned and have a good territory to run over, which has a tendency to harden the meat when fed on grain. This produces a better and firmer pork than the coarser-bred and heavy, thick-fat Eastern pork products. The raising of hogs and the feeding of grain to them will give a greater revenue than of handling grain in any other way, for there is always a ready market for grain-fed hogs at all times.

In former years when there was not a market in California for hogs, very little attention was given to hog raising, and what few hogs were raised were largely haphazard alfalfa and from acorns. The acorn-fed hogs are worthless. The pork product from acorns is soft and oily, and this is one reason why some people are still of the opinion that Eastern pork is superior to California pork. Where California hogs are fed on California grain the pork produced is as good as, if not superior to, the Eastern produced pork. California pork products bring within one cent per pound or as much as the Eastern products.

* * * * *

A SATISFIED SETTLER

The California Promotion Committee:

I am writing these few lines to let you know that I have arrived in California. I had very little trouble in getting work and have not lost a day since, and hope to get a first-class position in the near future.

I am greatly pleased with the country and have not the slightest desire to go back East again.

There is another Kansas family coming to California next spring, and they will locate in Oakland.

The climate suits me O. K., and will do all I can to induce my Eastern friends to come out.

The State has been badly misrepresented by some people, who expected to live off the fat of the land and not exert themselves any in doing so. I have endeavored to interest none but the best class of people in your State—people who are honest and industrious citizens, and they are what you want.

With best wishes for your success, I remain, yours truly,

(Signed.) W. H. GRIGG.

366 Fifth street, San Diego, California, Nov. 17, 1904.

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